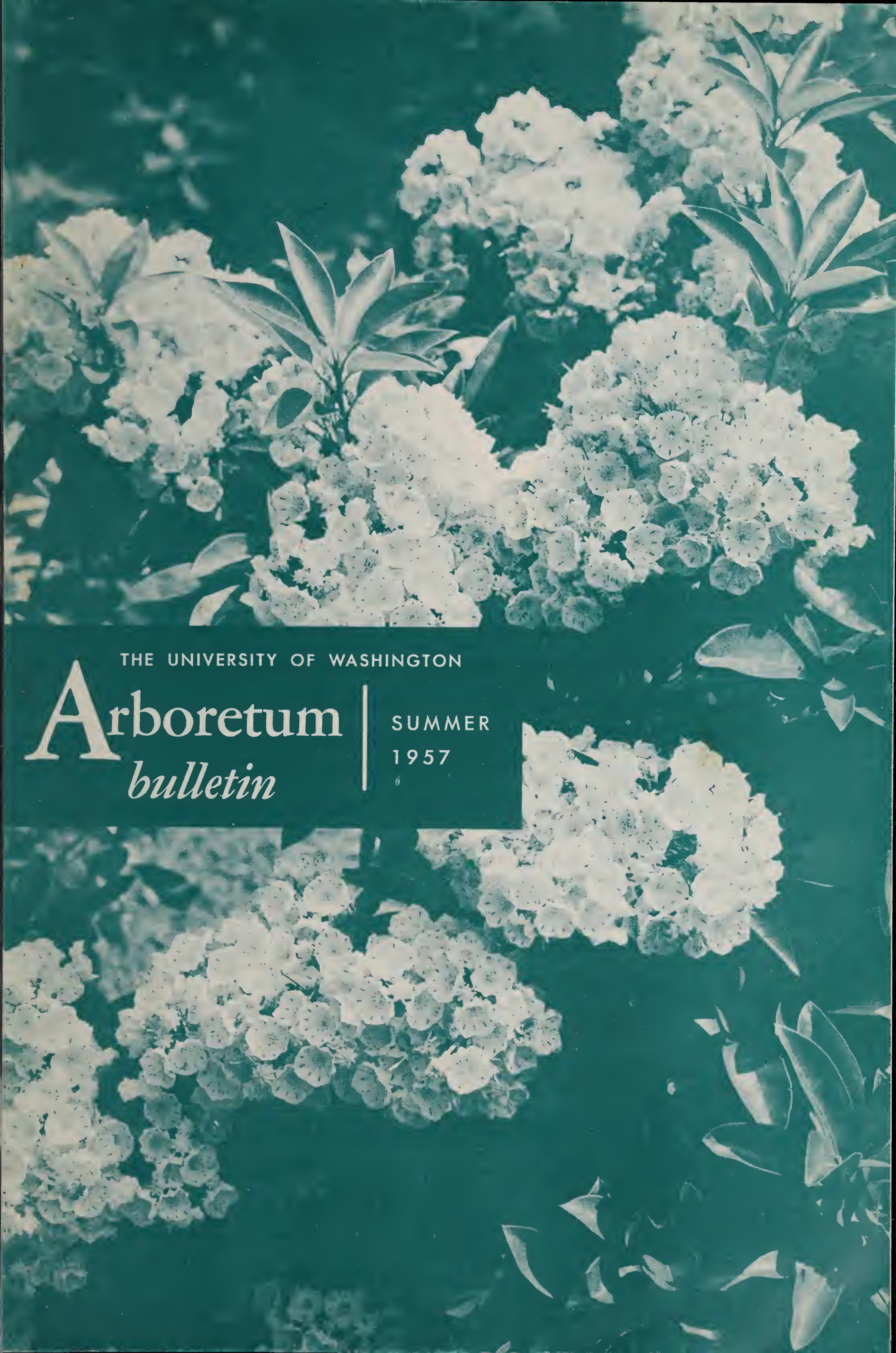

THE UNIVERSITY OF WASHINGTON

Arboretum *bulletin*

SUMMER
1957

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Arboretum bulletin

A JOURNAL OF GENERAL HORTICULTURAL INFORMATION
PUBLISHED QUARTERLY BY THE UNIVERSITY OF WASHINGTON
ARBORETUM FOUNDATION • SEATTLE 5, WASHINGTON

No part of this BULLETIN may be reprinted without the authority of the Arboretum Foundation.

VOLUME XX, NUMBER 2

Summer, 1957

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Cover: *Kalmia latifolia*
Mountain Laurel

Arboreta and Botanical Gardens in the Field of Plant Sciences and Human Welfare

R. J. Seibert *

THE Botanic Gardens and arboretums are a natural meeting ground for science, history, art and culture in general, yet their basic importance to the broad field of plant sciences seems to have been over-shadowed by a host of circumstances in recent years. Plant science research in certain specific fields has been of a nature which demands that the scientist know more and more about fewer and fewer plants. More than ever before our plant scientist is delving into research on new plants. Through rumor, search of old literature, mass chemical analysis of plants and ideas inspired by worldwide travel the botanic garden is increasingly more called upon to supply basic information about plants for the general public, the hobbyist, the professional, the industrialist, the technical laboratory, the plant scientist, the home gardener and the newspaper. Upon this point I would wish to say that the service of a botanical garden called on to give professional opinion, advice, information and service as well as to answer the old questions "what is the name of that plant?", "where does it come from?" and "how do you grow it?" is usually given free of charge. At most, this service frequently goes along with the benefits of taking out a 5- or 10-dollar annual membership, a contribution which scarcely pays for the member's servicing alone, much less for the time of some academically trained person to give a professional answer which may be the result of several hours' or days' research through the literature. May I merely pose the thought that if these services of the botanic garden and its recognized professional staff were paid for on the same basis that comparable professional advice, opinion, information and service is given by the medical doctor, the lawyer, the engineering consulting company, the professional art appraiser or the landscape architect, then perhaps the botanic garden, the botanist and the plant taxonomist would be looked upon as a highly respected addition to the community. Furthermore, the botanic garden more than likely could afford to hire an extra gardener to make the garden more attractive to the visitor.

The economic plant which was formerly grown and studied at the botanical garden has now been turned over to the experiment station and the chemist, where again the hand of the highly specialized is in demand. The economic plant, as usually referred to, is one which produces food or medicine, or other industrially usable product. We are all familiar with the fact that most of the economic plants were originally introduced and distributed to the other parts of the world through arboreta and botanic gardens. That is still going on today and no doubt will always continue to be an important function of theirs all over the world. I think, however, that we should revise our thoughts about economic plants. Statistics prove beyond doubt that the status of ornamental plants needs to be elevated to a position equal with that of "Economic Plants"—for that is what they are! Therefore, every arboretum and botanic garden is the potential source of new economic plants which eventually work their way into the trade and become that much more bread and butter to the nursery and cut-flower industry.

The floriculturist and the horticulturist have become concerned with bigger and better-grown, relatively few flowers and plants which can be mass produced most econom-

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*Dr. Russell J. Seibert, formerly director of the Los Angeles State and County Arboretum and now director of Longwood Gardens, Kennett Square, Pennsylvania, speaks with authority on this subject.

Reprinted from the *American Journal of Botany*, Vol. 43, No. 9, 736-738, Nov., 1956, by kind permission of the author and of the editor.

ically for mass public consumption through high-pressure advertising. Far be it from me to say that the arboretum and botanic garden cannot find or produce and publicize new and highly desirable plants for the trade. It is being done every day and no doubt will always continue. I do think that with a few exceptions far too little credit has been given to the responsible gardens for the hundreds of plants which they have introduced into the trade and which today help to pay the income taxes of thousands of nurserymen and florists, horticulturists and floriculturists.

The nurseryman has learned that it is easier and far more economical to mass produce a relatively few plants than to deal in great quantities of species. The more progressive nurserymen of this country are working closely with the arboreta and botanical gardens and, I might say, do fully realize the value of these institutions. That value, I believe, centers around several theories about the future of ornamental horticulture: (a) Fads in flowers (and plants) are and can be as changeably exciting as fads in the clothing industry. (b) Although mass-produced plants of relatively monotonous variety will continue to form the bulk of the initial landscaping of newly constructed homes, the demands of the novice home gardener, as he becomes acquainted with the fascination of home gardening, become more that of the connoisseur and he wants something different from that in his neighbor's garden. (c) Home gardening is America's No. 1 hobby. Hobbies mean collections and collections lead to the unusual and different. Therefore, the nurseryman who can qualify with these plant materials will increasingly more be sought out by the gardening public. The nurseryman's best source of the unusual is the botanic garden.

The landscape architect, formerly a good gardener, has become involved with drawing board design and mass-produced gardens to keep up with the building boom. Somewhere along the line he has settled on somewhat stereotyped planting materials. The landscape architect, if he is to hold up his end, must not only work on improved design and art appreciation but must keep up with his knowledge of plant materials and their every requirement and characteristic. I know of no better means for him to gain his knowledge first-hand than to spend a good deal of time in the botanical gardens exercising a combination of critical observation and creative imagination.

The botanist, taxonomist and plant breeder have all been more or less forced to go into specialties, all too often of little significance to the botanical garden connected with the botanical institution to which they are attached. The botanist and/or taxonomist in some instances either has been placed on a shelf or has placed himself on a shelf in the herbarium to occupy his time solely on the plant or plants of his personal interest, giving too little thought to the wealth of plantings growing in the botanic garden and used in the landscaping of his community. I think it is the obligation of every botanical garden to retain on its staff a man of taxonomic inclination who will devote time to the ornamentals or cultivated plants with which he is surrounded. He is just as essential to the botanical garden as is the propagator and the gardener. Certainly, the plant breeder-geneticist is an integral part of this team, for through his efforts and frequently long-term breeding programs come the improved plants of the future by which the botanical gardens can build a world-wide recognition.

The true naturalist far too often has no advanced degree and is relegated to some field of outlet other than the botanic garden. The naturalist, as I like to see it, is that person who is well versed with the technical but has the patience and aptitude to translate the technical into lay language. He is the bridge between the "technical" and "popular." He or she is your public relations—the personal contact with the garden clubs, youth groups, service clubs, the press, plant lover, John Q. Public and the home gardener.

(Continued on Page 80)

New Varieties of *Malus purpurea* Rehd.

K. Browicz and W. Bugala *

THE ARBORETUM at Kornik near Poznan is the largest and oldest dendrological center in Poland. For its beginnings we must go back to the first decade of the 19th century. At first it was a fine park in French style surrounding the old castle, property of Dzialynski, one of the Polish aristocratic families.

Since the middle of the 19th century many ornamental trees and shrubs from different countries have been grown in that park. Of special interest have been a great many North American introductions—*Taxodium distichum* (fig. 8), *Magnolia acuminata, Liriodendron tulipifera, Juglans nigra, Maclura aurantiaca, Gymnocladus dioicus, Halesia carolina* and many others. Among trees introduced about 100 years ago some are still growing and give a fine display.

In 1925 W. Zamoyski, proprietor of the castle and the park, offered his whole property to establish the Kornik Foundation. A. Wroblewski, one of the best Polish dendrologists, appointed director of the Arboretum, conducted this institution during the 20 years of his appointment with admirable skill and energy. He established the richest collection of beautiful trees and shrubs. He is said to have raised a great number of new and interesting varieties and his work on new forms of the purple apple tree has been particularly valuable. At present, after many years of observations, five of these forms have been chosen as being wonderfully ornamental and easily cultivated. In the climatic conditions of Kornik they withstand low temperatures and flower luxuriantly every year. The many forms of the *Malus purpurea* show great variety in color and shape of their buds and of tinge and size of flowers.

Malus purpurea "Hoser," named in honor of the Polish gardener P. Hoser. Floral buds purple. Flowers small, 4-4.5 cm. across, pink when young, long retaining the intensity of color, later lilac-pink. Petals to 2 cm. long, elliptic; stalks rather short, 2.5 cm. Pomes globose, 14-16 mm. across, dark purple, blue bloomy.

Flowers plentifully borne making a beautiful display.

Malus purpurea "Kobendza," named in honor of R. Kobendza, professor of dendrology. Floral buds small, purple-carmine, lustrous. Flowers to 4 cm. across, their tinge differing from the other forms. Petals elliptic, about 1.5 cm. long, purple-carmine outside, pink or pallid pink inside. Stalks very long, 4-5 cm., the longest of all forms, and slender so that flowers are drooping. Fruits globose, red-purple, lustrous, 14-15 mm. across, without sepals.

This form is related to *Malus Halliana* in tinge of flowers and in length of stalks. The latest flowering, it is also the handsomest of all forms of *M. purpurea*.

Malus purpurea "Makowiecki," in honor of the Polish gardener S. Makowiecki. Floral buds conspicuously dark-purple, nearly black. Flowers 4.5-5 cm. across, dark purple with lilac-pink tint, retaining this color during all the time of bloom. Petals wide elliptic, to 2.5 cm. long, at the base inside with white spots. Stalks 2-3 cm. long. Leaves red when unfolding. Fruits globose, black-purple, lustrous, 15-18 mm. across.

Flowers very late, almost at the same time as the previous form. Distinguished by the very dark flowers.

Malus purpurea "Szafer," in honor of W. Szafer, professor of taxonomy of plants and plant geography. Floral buds moderately long, lilac pink. Flowers large, 5.5 cm. across, pale lilac with pink tint, petals to 2.5 cm. long, stalks about 3 cm. long. Fruits dark-purple, globose, lustrous, 11-13 mm. long. The smallest of all forms of *M. purpurea*.

---

*The Bulletin is happy to present this first contribution to our pages from Poland, originating from the old and distinguished arboretum at Kornik. Others are anticipated in future issues.

Its chief distinguishing feature is its early flowering, the flowers being abundantly produced. It differs markedly from the typical *M. purpurea* in the pale lilac tint of flowers. It grows well and vigorously.

Malus purpurea "Wierdak," in honor of S. Wierdak, professor of forest botany. Floral buds distinctly elongated, a feature markedly characteristic for this form, dark purple. Flowers 5-6 cm. across, dark pink when young, gradually becoming paler and pallid pink at the end. Petals narrowly-elliptic, 3 cm. long. Stalks short, 2-2.5 cm. long.

This is an early flowering form. A vigorous grower, flowers in great profusion.

The forms of *Malus purpurea* described here grow in Kornik Arboretum as rather small trees, the head set on a trunk 1.6 meters high, or in shrubby form. They should be planted in small avenues in parks or gardens. They make a beautiful display of contrasting vivid colors when planted in batches. Fine color effects can be produced owing to the difference in the time of bloom. Unknown outside Poland, the Kornik Arboretum has recently sent cuttings to some botanical gardens in Europe. It is hoped they will soon become popular and will thrive well in all gardens.

Below:

Swamp Cypress Tree at Kornik Arboretum

(Fig. 8) —PHOTO BY W. BUGALA

* * *

A note from Miss Harriette R. Halloway of Plainfield, N. J., relating to our native Western dogwood.

How I do wish you could see our youthful Nuttallii! It is just under five feet in height and *completely under* a mass of white blooms so thick that the supporting twigs and branches do not show through! We now have 47 varieties in the little arboretum. From the nursery one more will be ready in 1958 and *two* in 1959—total 50! With appreciation.

HARRIETTE R. HALLOWAY
May 5, 1957

Woody Plants for Walls in Western Washington

ROBERTA A. WIGHTMAN, A. S. L. A.

GARDENS OF TODAY—designed for ease of maintenance and maximum year-round beauty and usefulness — are almost wholly lacking in severe, clipped lines of hedges, edgings and screens. We want our trees and shrubs to assume their own characteristic, normal, natural shapes and sizes. Except as historical and classical works, to be preserved as such, gone are the days of the topiary garden, the boxwood and yew vases, urns, peacocks, papa bear and baby bear, cubes, cones, spheres, etc. This change, welcome to most of us, is due probably to two major influences; scarcity of skilled gardeners and "style" of houses and gardens.

This situation results in an increasing awareness of the art and craft of pruning—there is less to be done, thus it must be done with utmost skill and prudence.

Wall trees and shrubs are garden additions and enhancements which must be pruned painstakingly and constantly. Wall trees, particularly the fruit trees, are a bequest from Europe. In England, with a climate similar to ours, the fruit of trees trained on walls would be ripened by the warmth of the wall and the reflected light. The wall tree saved precious garden space, too. The French noun *espalier* means "on a trellis" or "a trellis."

Our wish for wall coverings is more aesthetic than nutritional. The training of fruit trees *en espalier* will not be discussed here except to advise that the training should begin early and that the dwarfed varieties are being used more frequently than the standard size trees.

Horticulturists, nursery catalogs, reference books and garden magazines tell us of many woody plants suitable for wall covering. It remains for the individual, however, to try out and to approve of them. Some writers are so glowing in their praise of some plants that when we find, from experience, that we cannot agree, we are disappointed and discouraged.

Trees and Shrubs

From experience and observation the trees and shrubs which seem to "tolerate" the constant pruning and care required to *espalier* them in this locality are: *Arbutus Unedo*—a broad-leaved evergreen shrub with medium-sized leaves and moderate rate of growth; certain "willowy" varieties of *Camellia Sasanqua,* another broad-leaved evergreen, with slightly fragrant white and shades of pink flowers so welcome in November, December and January. Their blooming period is dependent on the season, temperature and exposure. It has been found that exposure to the south winter sun and the south winds produces yellowish foliage and few if any flowers. *C. Sasanqua* foliage is medium-fine texture and rate of growth is moderate. Varieties of *Chaenomeles*—the flowering quinces—are among the most adaptable of wall shrubs. The branching pattern of this early-blooming deciduous shrub is ornamental at all times and the effect of March blossoms on bare stems against stone or dark wood wall is unique. *Choisya ternata,* a broad-leaved evergreen of medium-fine-textured foliage and fairly rapid growth, is and can be successfully used as a wall shrub. Of the cotoneasters the species most frequently used as a wall plant is *C. horizontalis.* This shrub seems to almost spread itself, fan-like, against a wall surface and we value it for its branching habit and for the decorative red berries in fall and winter. *Cotoneaster horizontalis* texture is fine, its growth rate moderate. A rapid-growing, fine-textured, broad-leaved evergreen shrub which has proved a good espalier subject is the escallonia—particularly the small-leaved species. Blooming in mid-summer the "trained" escallonia is most welcome. A broad-leaved evergreen tree which can be wall trained is the southern magnolia, *M. grandi-*

*This is a welcome first article by Miss Wightman, prominent local landscape architect.

flora. This is a subject with bold, coarse-textured foliage, fairly rapid growth, but only for a large wall. One of the most responsive shrubs to a wall location is *Viburnum Burkwoodii*. The foliage pattern is open, not dense, the texture medium, and the growth rate rapid. The flowers are fragrant and bloom in earliest spring. The fruit trees most often used *en espalier* in this locality are apple, crabapple, pear, peach, nectarine.

Climbing Shrubs

There are a few woody plants which, while rampant growers, have not the stamina to be self-supporting and need a wall or fence to lean against. The four most frequently seen are varieties of *Euonymus Fortunei (radicans)*, a small-leaved evergreen with moderate rate of growth. This shrub needs to be fastened to its wall or fence as it attains height. To use the deciduous Boston Ivy (see below) as its "supporter" gives a triple-purpose effect—evergreen leaves in winter, flame-colored leaves in autumn, quick coverage. The hybrid of *Fatsia* (formerly *Aralia) japonica* and Ivy *(Hedera Helix)*, known as *Fatshedera Lizei*, is another climbing shrub which has to be supported. This plant tolerates much shade, grows fast and the large shiny leaves provide a bold, bright green against a wall. The variegated-leaved variety is even more striking but is more tender. The pyracanthas are known to us all as being dependable, hardy, colorful climbing shrubs. There are many shades of red and orange berries from which to choose; the shrub has a fine texture and is a fairly rapid grower. Climbing roses, with a great range of flower color and size and season of bloom, would certainly rate second to *Pyracantha* as favorite climbing shrubs. If carefully trained and pruned the bare green stems in winter are lacy and decorative. A few varieties in favored locations may even be called "evergreen."

Vines

Vines which cling to the wall surface itself are few in number: English Ivy, especially its small-leaved varieties, are ornamental, dense, dependable, fairly rapid-growing and evergreen. The climbing hydrangeas, *Hydrangea petiolaris,* and close relative *Schizophragma hydrangeoides,* are deciduous, summer blooming, clinging vines whose winter effect, if wisely pruned, is picturesque with their flaking, shredding bark. Growth is fairly rapid, texture of foliage medium. Virginia Creeper—*Parthenocissus* (formerly *Ampelopsis) quinquefolia*—which seems to know no bounds, is a fast-growing, clean, deciduous vine valued especially for its brilliant fall color, as is its sister Boston Ivy, *P. tricuspidata,* and varieties. The latter clings more readily as it has adhesive discs at the end of each tendril. We have tried *Pileostegia viburnoides* from China and *Decumaria barbara* from the southeastern U. S., both of which failed to put forth aerial rootlets long enough or strong enough with which they are said to cling.

All the other vines used in the Northwest, including clematis, bittersweet, jasmine, Algerian Ivy, silver lace vine, trumpet vine, grape, wistaria, honeysuckle, and *Akebia* must have the support of trellis, fence or wires. Of the above, jasmine, Algerian Ivy, *Akebia, Clematis Armandi* and Hall's honeysuckle are evergreen.

A few woody plants have been used successfully on top of retaining walls to hang down over the walls. They are Kinnikinnick—*Arctostaphylos Uva-ursi,* native broad-leaved evergreen ground cover, fine texture, rapid growth, slow to establish, reddish green color; *Ceanothus gloriosus*—small grey-green leaves, evergreen, fairly rapid growth, blue flowers in early summer; *Cotoneaster Dammeri (humifusa),* the Bearberry Cotoneaster—effect similar to Kinnikinnick except leaves are longer and not so shiny. Creeping junipers, especially the Tamarix juniper, *Juniperus Sabina tamariscifolia,* makes a soft grey-green blanket which drapes down over the top of a wall, as does *Juniperus conferta*—the shore juniper of Japan.

Generally speaking, we could say that wall shrubs are man-made in that they are not permitted, by man, to assume their natural

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Stewartias

Mrs. Frantz Nehammer*

HANDSOME is as Handsome does. Many of us remember being reminded that an even temperament with a sunny disposition and good manners were equally desirable as beauty. When all these attributes are to be found in one plant we then have a most worthy subject for the garden design. Handsome, indeed, are the Stewartias and wherever found in the garden they attract attention. They have a distinctively beautiful branching structure, rather open and rarely twiggy. This pattern of branches silhouettes well against the sky. Handsome, too, are the leaves which appear quite early, unfurling with a softly shiny surfaced texture, and in the autumn we can expect a brilliant display of red, yellow and copper tones. The flowers, beginning to open in July and August, have the fragile appearance of white silk crepe and in some kinds are very large and open and in others small and cupped in shape. They are all white and vary only in size, shape and color of stamens. White flowers in the heat of the day or at dusk have the power to soften and bring serenity to the scene.

Their culture is not difficult in an area where we can give them the humid atmosphere and cool soil they desire. Planted where the soil is rich, moist and porous with ample light and some sun for their branches, they will continue to bring their beautiful display year after year. Use them with rhododendrons and azaleas; not only will they complement each other but the overhead branches will protect the rhododendrons and they in turn will protect and shade the soil from becoming dry and baked. In combination the blooming period will be extended in the border. Do not plant them in shade if you would have them flower well and bring a flaming splash of color in autumn.

Have patience, gardeners—but all gardeners must learn this, for most worthwhile plants must be nurtured over a long period to bring them into full maturity. An old saying, "Old men plant trees and young men plant annuals."

The Stewartias resent transplanting for they root deeply, so only young plants should be purchased unless some nursery has root pruned them every year. They do not bloom when young, yet the development each year of the structure, the leaf pattern and autumn color makes the waiting not too difficult. Landscaping with the Stewartias gives the designer material of long life, good structural height without weight because they have a fine open appearance attractive in winter. They do need ground coverage and, rather than mulch, I find many small shrubs and perennials and also ferns set them off to advantage.

I know of only three species generally grown in this area, although the Arboretum is growing three others, *Stewartia monadelpha, S. sinensis* and *S. koreana,* all of which are hardy and thrive on the coast.

The one most planted in this area is *Stewartia pseudocamellia* and, as the name implies, the flower resembles a single camellia. This is the largest in structure but so slow growing will rarely exceed twenty feet. The flower in bud is like a small ball of cotton and opens to a cupped shape surrounding many distinctive orange stamens. The leaves will color beautifully and remain on the branches for quite a long time.

The variety *grandiflora* of the species *pentagyna* is possibly the most desirable for several reasons. This is more a shrub form and will mature and bloom at an earlier age. The leaves are large and numerous and the flowers appear on very short stems in the axes of the

(Continued on Page 71)

*Too long since we have seen Mrs. Nehammer's name in our pages ("Unusual or Outstanding Shrubs and Their Uses in the Garden," Fall, 1945.) We are grateful for her return with this informative article on the popular Stewartias.

Vine Maple*

Acer circinatum

C. Frank Brockman

DEPENDING upon one's interests and occupation, vine maple may be regarded as a botanical Dr. Jekyll and Mr. Hyde. To the forester, especially those in that profession who are primarily concerned with the re-establishment of commercial stands of coniferous trees on denuded forest land, it is a serious detriment to his eventual plans. Vine maple often forms dense thickets over extensive areas which, by modern standards, were badly logged in the past and which, through poor management, have remained unproductive. These thickets not only hinder planting operations but, more seriously, retard the growth and proper development of coniferous seedlings should they become established in such areas. And any forester who pushes through such thickets in the course of his duties in wet weather or on a moist, chilly morning will testify that the constant cold shower that his movements induce is often anything but pleasant.

Yet one cannot fail to acknowledge the beauty of this native northwestern shrub or small tree. Particularly in the fall the foliage of the vine maple assumes vivid shades of red which contrasts sharply with the somber green of our largely coniferous forest cover, lending brilliant highlights of color to what might otherwise be considered a drab season. True, the fall color in our area does not compare to the autumnal brilliance of the Lake States and New England, but in October our verdant mountains are splattered with crimson patches of vine maple. It would appear that

*This is the fifteenth in our series on Native Trees of the Northwest.

Below:

Vine Maple in Flower—*Acer circinatum*

(Fig. 9) —PHOTO BY E. F. MARTEN

the legendary Paul Bunyan had again returned to this region and, carrying a gargantuan bucket of red paint in each hand, had splashed this color irregularly over the countryside as he strode about the terrain.

Nor does the beauty of vine maple foliage suffer by close inspection. It is a delight to the eye of the artist, the photographer and the interior decorator. Mature leaves are thin, glossy green—darker above the light green below—with 7 to 11 palmate lobes having sharply toothed margins, and slender stems of one or two inches in length. They are borne opposite upon the branches. In early spring the developing foliage is characterized by a rose-red color, later changing to green with maturity in summer and, as previously noted, assuming brilliant shades of red in early fall before falling to the ground.

Appearing at about the same time as the foliage are loose clusters (corymbs) of small reddish-purple flowers (fig. 9) which eventually give way to the typical maple-like fruit—a double winged samara with wings about ¾ inch long. In the case of *Acer circinatum* the wings extend outward almost in a straight line and have a reddish coat.

Although vine maple occasionally assumes the stature of a small tree—up to 30 feet tall and 6 inches in diameter—it is generally encountered as a tall, sprawling, many-stemmed shrub to 25 feet in height. Its general form is extremely irregular, variable and shapeless with long, slender, and often twisted stems. Except at the base of the larger tree-like specimens—in which case the bark is dark, seamed and broken—the bark is smooth and green to greenish-brown in color.

In addition to *Acer circinatum*—the most common of the two species west of the Cascades — one may also note *Acer Douglasii.* The latter species is characterized by foliage having 3 to 5 (mostly 3) lobes, and samaras whose wings are not as widely spread. *Acer circinatum,* the more common of the two species in the Puget Sound region, has a more restricted geographical range—from southern British Columbia southward to the coastal section of northern California.

Let's Brag About Our Arboretum Units

With an eventful year just closing, Mrs. J. Wendell Trosper, retiring general chairman, was given a vote of thanks at the last Unit Council meeting, May 16. She praised the Units for the year's work and touched on some of the highlights.

Botany classes through the year under the leadership of Mrs. Page Ballard, as well as a series of study courses arranged by the chairman, Mrs. Roy Anderson, were well attended.

Unit No. 65, "The Grandmothers' Unit of Broadmoor," took over the project of providing more benches for the Arboretum. Mrs. W. F. Paddock, who investigated the situation, announced that there will be twelve new stone benches, the cost of which will be underwritten by various Units. These will be placed in strategic spots along the trails and will no doubt be much appreciated by visitors.

The Second Annual Work and Fun Day on May 1, with over 300 workers attending, was a great success as evidenced by a note to Mrs. Leonard Wilcox, chairman, from our director. (see below)

New Unit Council officers for the coming year were announced: Mrs. Frank Calvert, general chairman; Mrs. Lloyd Adler, first vice-chairman; Mrs. Conner E. Gray, Jr., second vice-chairman; Mrs. Kenneth L. Mead, secretary, and Mrs. Leonard Wilcox, finance.

Dear Mrs. Wilcox:

It is a pleasure to all of us here to see the greatly improved condition of so many areas in the Arboretum, as a result of the labors of numerous enthusiastic workers from various Arboretum Units and Garden Clubs in the Arboretum on Wednesday.

As you were greatly responsible for so much being accomplished in just a few hours, I want to express our very grateful thanks for the careful organization as well as the hard work which produced such a highly satisfactory result. Certainly this will ease the pressure on our small crew so far as weeding is concerned for some weeks to come, which, at this busy time of the year, makes it particularly helpful.

Sincerely yours,
B. O. MULLIGAN, Director

* * *

Iris gracilipes is a woodland plant and does its best in half shade. Divide it immediately after flowering for best results.

The Art of Bonsai

Mrs. W. Webb Moffett *

BONSAI are far more than potted plants—they are works of art. As such it is impossible to give pat rules on how to achieve a fine bonsai any more than one could describe how to compose a fine symphony, paint a masterpiece or write great literature.

The mechanical aspects, such as the collecting, potting and care, can be described . . . their origin, tradition and use from centuries ago until the present day can be told . . . but the artistic side of these tiny trees is almost impossible to convey to another. I agree with one author who says, "Bonsai are planted in philosophy, shaped by art and grown with love."

First, the definition of the word. Bon means tree and Sai means scene. A tree scene. Therefore, bonsai are not just miniature trees, they are trees which have been dwarfed to be interpretations of the same trees towering in the forest. They recreate a scene from nature. Remember, too, that dwarfing does not necessarily mean distorting. If a tree grows tall, majestic and straight in nature, so it should be recreated in the container. However, in training a pine in dwarfed form, for example, it would be correct to strive for a windswept effect, of a tree twisted and bent by storms and age, for that is how the pine is often seen in nature.

Such a creation by an amateur has no price. A grower of bonsai as a hobby would no sooner sell his little trees than he would sell his children. As one such bonsai grower said, "I would not sell one of my trees for any amount of money, but if I loved you I would give you one!"

Bonsai originated in China in the pageantry and symbolism of their New Year festival. They potted little flowering trees and forced them into bloom as nature's welcome for the new year. The Japanese borrowed this idea for their own New Year celebrations and also borrowed two other Chinese customs—the use of potted flowering and fruiting trees to decorate their secluded courtyards, and the use of rockery to represent distant mountain scenery.

At some time, calculated by some as more than 1000 years ago, the three ideas merged. The little potted trees were cultivated to decorate both the home and garden year around and a few rocks and moss were added to further suggest a mountain scene. The first authentic record of bonsai is found in a celebrated picture scroll dated 1310. In the fifteenth century bonsai was the subject of a moving classic play which tells of an impoverished but warm-hearted samurai who, on a cold wintery night, burns his favorite bonsai to warm a guest who proves to be a great shogun traveling in disguise. The Japanese love the sentiment and significance of this play and it is still shown on the stage in that country.

During the 17th, 18th and 19th centuries, bonsai flourished with all the arts. About a century ago the tendency was to dwarf trees to grotesque misproportion but this unnatural interest gradually disappeared.

Bonsai, like other oriental arts at the end of the 19th century, were exhibited outside the country, too. One Japanese writer and grower tells of the Japan-British Exposition in 1911 and the surprised delight of the English in seeing the little trees from Japan.

By 1928 many bonsai exhibitions had been held in Japan and elsewhere, professional growers were in abundance as well as amateurs and many individuals had extremely valuable collections with trees valued up to four thousand dollars. Small villages where the inhabitants did nothing but grow bonsai for the market were started and it was unusual to enter any house, from the palace in the capital to the poorest village hut, without seeing at least one specimen. Bonsai were an

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*Mrs. Moffett will be remembered for her excellent article on the "Evolution of Modern Landscape Design," Summer, 1953.

integral part of the domestic, artistic and horticultural life of Japan.

Until 1919 bonsai could be brought into this country from Japan and many were, but after that time the rigid and ruinous fumigation imposed upon them permitted the survival of few.

However, bonsai cultivation in this country has existed since the turn of the century. Not by many, it is true, but travelers returning home from Japan brought tales of the wondrous little trees and many of the Japanese families transplanted here brought family bonsai with them or started new ones.

The Brooklyn Botanic Garden in 1925 received the collection of a Mr. Ernest F. Coe, then of New Haven, Connecticut. There were thirty-two trees representing twenty-one species imported from Japan in their original containers before the quarantine went into effect. In recent years the Brooklyn Botanic Garden brought Kan Yashiroda to this country to teach a course in the art and many are taking the training at the Brooklyn Garden.

California has many professional and amateur growers as well as bonsai clubs, and many of our bonsai found in the Northwest come from California nurseries.

Articles have been published on bonsai in the past few years; recently a fine book on the subject has appeared which was written by an American* and interest in the little trees is growing year by year. It is not surprising. Bonsai make ideal decoration for the patio as well as the home. They seem to fit in with any decor, especially modern.

One warning, however. In Victorian days when these potted trees were put in stuffy drawing rooms they withered and died and the legend grew that only the Japanese knew how to grow them. Their culture was pronounced one of the great mysteries of the Orient. So, capitalizing on this old myth, in recent years unscrupulous promoters offer all the "secrets" of growing dwarfed trees and a package of special seeds guaranteed to produce real bonsai for a sum of money. These "living Ming trees" are still being advertised in gardening magazines and it is hoped that few are taken in by them. Growing bonsai is no secret.

There are many kinds of bonsai. First classification is by size. Large bonsai range from 26 to 40 inches in height and are grown in sizable pots and tubs. These are mainly used in the patio or garden. The most popular bonsai used in both home and garden is the medium-sized from 12 to 26 inches in height. The small bonsai, from 7 to 12 inches, are fancied by many, and the most difficult to grow of all are the miniature bonsai called "mame bonsai"—all specimens under 7 inches in height.

All bonsai are further classified by the number of plants growing in each pot—ranging from a pot containing a single specimen (from which several trunks may spring) or bonsai with several plants in the same pot. This "grove" type of bonsai may also be achieved by planting a young, well-branched tree horizontally in a container. The recumbent trunk is covered with soil and the branches which rise from it resemble in time a grove of individual trees.

The "ishi-tsuki," meaning "with a stone," is a style where one or more trees are planted on top of a rough stone, either in a pocket or

*Bonsai, Miniature Trees, by Claude Chidamian (1955)

Very old *Chamaecyparis obtusa* growing out of Brain-coral rock.

(Fig. 10)

with the bare roots simply clasping the stone and running down the sides into a container of soil below. The effect is highly realistic, suggesting a tree perched on a mountain crag or overhanging a rocky coast (fig. 10).

Bonsai are also classified by the shape and style of the trunk. There is the "upright" trunk representing a tree standing proudly erect in level country, or the "free upright" style in which the irregular upright growth is traditionally arranged in three tiers to represent heaven, man and earth.

Secondly, there is the slanting trunk which imitates a tree growing at right angles to a mountain slope and then the "cascade" style which represents a tree rooted in a high crevice looking down a deep gorge. There is the "gnarled and twisted trunk" bonsai suggesting a tree growing on a storm-swept crag, the "wind-swept" style, and the "split trunk" style which suggests an ancient tree with decayed trunk. One of my favorites is the "roots above the ground" style which characterizes old trees with their roots exposed.

Which plants make good bonsai? The list is too long to enumerate. Just remember that the bonsai must be of elegant proportion with neither the leaves, needles, fruit or flower too large and therefore out of proportion to the trunk and branches. For example, if one were trying camellias one would choose sasanqua.

Pine is the most popular of all trees for bonsai. The five-needled pine, *Pinus parviflora (pentaphylla),* is best because its needles are short. *Pinus Thunbergii,* although often used as bonsai, really has too long a needle to be correct. *Cedrus atlantica glauca,* especially the form *compacta, Cryptomeria, Chamaecyparis obtusa* (fig. 10), and *Juniperus chinensis,* particularly the prostrate variety *Sargentii,* are all excellent material for bonsai. Spruce is ideal, as is yew.

Deciduous trees are a delight as bonsai. With bonsai the apartment house or city dweller can watch and delight in each season for, in spring, they give us hope with bursting buds and blossoms; in summer, richness with leaves and fruit; in the fall, bright fulfillment, and in winter the wondrous tracery of patterned branches. The Japanese consider the deciduous trees the most poetic of all bonsai; as Claude Chidamian, bonsai author, says, "Is it any wonder that they have sought to capture the seasons in these tiny, ever-changing boughs?"

Deciducus trees which may be adapted to bonsai are beech, birch, *Carpinus,* elm, *Ginkgo,* larch, *Liquidambar,* maple and willow. Of course, the flowering trees are the most lovely of all as bonsai. Remember the rule of proportion which will eliminate large blossoms. Suggested are apricot, azalea, camellia, cherry, peach, pear, quince and wisteria.

We have many native trees which adapt well into bonsai. The vine maple makes handsome bonsai, as do the true firs.

In Japan they like to put three trees together because of the auspicious meaning. Pine, the symbol for unchanging, bamboo which symbolizes straight-forwardness, and plum for its fragrance. Oak is also greatly admired, for when the leaves, although brown and dead, remain on the branches throughout the winter, this indicates persistence and fortitude.

Where and how are these trees obtained?

A favorite method with many is the collecting of proper and choice specimens in the high altitudes of our northwest mountains. Of

Grove of Short-needled Pine
(Fig. 11)

course, with large or fairly old trees, they must be root-pruned for a year or two before lifting. These trees should be planted in the garden for several years and root-pruned down to a small ball gradually before placing in tub or pot.

Many purchase nursery plants with good line possibilities and chances of survival are better with this method than by bringing in larger rooted trees from the woods. The roots are already compacted into a ball and the branches and trunk still pliable.

Seedlings out of the woods and gardens are another possibility but they have the disadvantage of taking many years before looking old. Seed would have the same disadvantage. Cuttings sometimes make fine small bonsai but here again the trunk is small and the tree young looking. Grafting is employed by many commercial bonsai growers and does give the desired old effect if the graft is not too ugly.

Containers a few years ago were very difficult to find locally but that is no longer the case. Any Japanese store now sells bonsai pots. Some of the wooden containers are very handsome, but generally bonsai look best in Japanese bonsai pots. Good bonsai pots should be subdued in color and graceful in form for they are to bonsai what frames are to paintings.

The earthen clay pots, unglazed and porous, are best for the growing tree. Bonsai should be started in such a pot and then, when well-established, transferred to the more decorative glazed container. You will notice that the drainage holes are unusually large on bonsai trays for proper drainage is the most important single factor (except watering) in proper maintenance. Place a concave piece of clay pot over each vent—allowing the water to drain but preventing the dirt and roots from escaping.

At the bottom of each container some material such as fine gravel should be placed and this should fill about one-fourth of the depth of the tray. There are four basic ingredients in the mixture of proper bonsai soil; clay—dried, broken and screened into uniform granular pellets—thus forming tiny air pockets, a rich loamy topsoil to give the bonsai nourishment, sand to increase drainage, and humus to assist in holding moisture. Use common sense as to the proper proportion of these ingredients, just remembering that the little tree wants mainly a reasonable facsimile of its native soil.

How does one pot bonsai? As explained, the trees brought in from the mountains should be grown in the garden and the ball reduced by root-pruning for several years before transfer to the unglazed pot. The nursery plant can usually be root-pruned and placed in the pot immediately. These first pots should not be too deep, the five-inch squat type of common clay pot is best.

Bonsai are potted at various times of the year. Conifers, broad-leaved evergreens, deciduous trees and summer and fall flowering trees are potted in the early spring. Spring-flowering trees such as cherry and azalea are potted after they finish blooming, and hardy fruit-bearing trees are potted in early autumn. No bonsai are potted in the winter months except, in the west, deciduous trees which may be potted in October or November.

When potting, the soil should be gently picked away from the roots on the sides and bottom and the remaining ball should be about one-fourth smaller in diameter than the pot selected. Spread out the roots and leave as much of the base showing as possible. Build the soil up into a mound around the base as one always sees a tree in the forest growing. Firm down the soil with a blunt instrument like the end of a hammer. It is well to then plant moss or a small ground cover to help retain moisture and give a realistic effect. Sand, crushed rock or pine needles may also be used as a top dressing and then the placement of just the right rock or rocks or piece of wood will complete the picture.

In round or five-sided trays the tree should be placed in the middle; in the rectangular or oval about two-thirds of the way from one end.

Repotting is a question which is most de-

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Arboretum Spotlight

Stewartia pseudocamellia

CERTAIN trees, for instance the flowering cherries, are grown for the beauty of their flowers; others, such as the sweet gum, for their spectacular autumn color; some other trees have two seasons of interest, as for example, the flowering crabapples with gay flowers in the spring and brilliant fruits in the autumn. The subject of this spotlight is not limited to one or two seasons of interest, for it repays its owner with three.

Stewartia pseudocamellia is at its handsomest in early to mid-July when the whole tree is set with white, single flowers, 2½-3 inches across, decorated in the center with a ring of bright yellow stamens (fig. 12). These flowers give the plant its specific name, for they are strikingly similar to those of a single camellia. Its later flowering date is a strong point in its favor since we have so few trees that bloom after the main May and June rush. September and October bring the Stewartia to the fore again with a burst of autumn coloring. Not so gay, perhaps, as its cousins *S. koreana* and *S. monadelpha,* its foliage changes from a good light green to a deep, rather dark crimson, often with yellow and brown intermixed.

In winter, when the leaves have dropped and the form of the tree is evident, we find its third season of interest. The bark, a light russet gray, which flakes away from the stem, seems to be the perfect foil for the very interesting zig-zag pattern of branching. Although it has been reported as a tree of some 60 feet or more tall in its native Japan, it probably will remain small enough in our area to be useful in the smaller gardens. Our finest *Stewartia pseudocamellia* is growing in the camellia section, along with five other members of its genus, and is now about 20 feet high. Visit it summer, autumn and winter—you won't be disappointed. J. A. WITT

Below:

Stewartia pseudocamellia

(Fig. 12) —PHOTO BY E. F. MARTEN

Some Delightful Small Bulbs

Beth Gilley Malmo*

THE first flower of the new year in my garden is not, as one might suppose, the rugged snowdrop or an early crocus, but a tiny yellow daffodil, *Narcissus minimus,* or, more correctly, *Narcissus asturiensis.* This blossoms the last week in January when the air is chill with melting snows. Reduced to three-inch stature, this golden tiny miniature is so similar in shape and appearance to the large-flowered yellow trumpets such as King Alfred that one has the impression one is looking at it through the wrong end of a telescope. That any blossom so frilly of trumpet and fragile-appearing can defy the wind and weather of January fills one with admiration and delight. This is a native of mountains in Spain. On January 27 some of these were picked for a tiny bouquet and on March 1 this little patch was still in bloom, but on March 10 the blossoms were fading fast. In 1954 these started to bloom January 30, right on the heels of two weeks of heavy snows and 20-degree weather. This is a cheerful grower and increases its bulbs each year.

Usually the next daffodil to blossom—about the second week in March—is six-inch-high *N. cyclamineus.* The long, narrow trumpet thrusts forward and the perianth thrusts straight back, as someone has said, "like the ears of an angry mule," giving the impression of a very long, very narrow yellow flower. In its native Spain it grows on the margins of streams and would probably like more moisture and peat in the soil than has been given it heretofore. It never stays with me very long. This daffodil has been used for hybridizing and we have February Gold (fig. 13), a March trumpet daffodil of ten-to-twelve-inch stature. A planting of several hundred massed on the south side of a University District garden starts to bloom in very early March and gives several weeks of color before daffodils generally are blooming in masses anywhere. A newer and high-priced hybrid is Peeping Tom, in which I was disappointed. Leaping up to a height of fifteen inches or so, and unfolding a very large blossom in the manner of the big trumpets, except that its perianth is backthrust, it loses all the delicacy and charm of *N. cyclamineus* itself.

The Hoop Petticoat Daffodils are charming. *Narcissus Bulbocodium conspicuus* itself is a deep yellow but a greater favorite is beautiful pale *N. B. citrinus* from the Pyrenees with very large flaring trumpets of a lovely cream color. These bloom together in April and make a most interesting display. The seeds ripen in early June and should be carefully sown immediately about the main planting which will gradually increase in size and beauty. Other forms of the Hoop Petticoat Daffodil are sometimes available; *N. B. tenuifolius,* small and early flowering; *N. B. obesus* with shorter stems and late blooming. However, *N. B. monophyllus,* white, and *N. B. Romieuxii,* pale yellow, from Morocco, are reported not definitely hardy for out-door culture here.

Angels Tears, *N. triandrus albus,* also from Spain, is an April flower. Charming pale yellow blossoms, two or three or more in a cluster, droop earthward on slender eight-inch stems and may be used as cut flowers, or, if left in the garden, will set seeds most satisfyingly. Seedlings bloom in three years' time to give variations in height, size and coloring. This is a very easy, very dainty must-have.

Narcissus minor, a six-or-seven-inch miniature yellow trumpet daffodil, is planted in wide patches in back of the Arboretum offices. This blooms in March and is a most desirable treasure of a daffodil which increases its clumps each year.

In the Arboretum's Winter Garden is *Narcissus obvallaris* a native of South Wales, blooming in masses in March. This 12-inch

*A timely account by Mrs. Malmo (of the Editorial Board) of the many small spring blooming bulbs which require planting from August onwards.

trumpet daffodil of golden yellow is valuable for its early flowers, but does not have the dainty slenderness which characterizes many of the smaller species.

The daffodil season closes for me in May with *N. gracilis*. On slender eight-inch stems clusters of three to five tiny disc-like flowers give forth a most penetrating sweetness, amazing for so small a flower.

The Snowdrops are among the flowers of winter—"Nunlike, flawless, crisp, less flowers than a little gasp of white astonishment." Most frequently seen is the little *Galanthus nivalis,* the common snowdrop of our grandmother's garden, but today there are available many species that come earlier than this. A collection of the many kinds can be most interesting.

Galanthus Elwesii, one of the finest that grows and easily available from many bulb specialists, has large snowy flowers swinging on ten-to-twelve-inch stems. This comes to us from the mountains of Asia Minor, likes full sun and to be dried out in summer. This blooms about the last week in January.

Galanthus nivalis plenus, the double form of the common snowdrop, comes a little later than the single type, and the ever-widening patch is enchanting with its fat little blossoms nodding in the wind on short stems.

There are many fine ones to be sought out in special lists. *G. nivalis Atkinsii,* one of the tallest and very early; *G. n. lutescens* with yellow tips instead of green; *G. n. maximus,* large flowers on long stems, a very fine one; *G. n.* S. Arnott, said to be fragrant, with a flower one inch in length; *G. n. viridi-apice,* a very beautiful one with especially green-tipped petals.

Moving snowdrops is a tricky business. Leave them undisturbed when they are doing well. An established patch resents disturbance and many fine ones are lost because of this.

Blooming with the snowdrops are some of the earliest bulbous Iris such as *I. Bakeriana,* fragile appearing and very fragrant, *I. Dan-*

Below:

Narcissus "February Gold" in the Winter Garden

(Fig. 13) —PHOTO BY DON NORMARK

fordiae, yellow, and *I. histrioides major,* very large and very blue. These were all picked for a bouquet one January 26, together with wee *Narcissus minimus, Cyclamen Atkinsii* and *Galanthus Elwesii.* These choice three-to-six-inch iris are all easy providing that the bulbs are given a summer baking. *Iris Danfordiae* after blossoming has the maddening habit of splitting into tiny bulblets and these must be grown on for a couple of years at least before blossoming again. Many of these very early iris bloom without leaves, which come later and may, as in the case of *I. Bakeriana,* make a beautiful foot-high fountain of foliage.

Purple *Iris reticulata* is found in many gardens, and stemming from this are several named varieties which are usually mere color variations. This starts to bloom from early to mid-March. One named variety, Cantab, is a beautiful soft blue and blooms about ten days earlier than the purple *reticulata,* a most desirable plant. Later the stiff, upright, slender leaves attain a height of about a foot and then, late in May, the foliage dies away and the bulb rests until roots begin to form in August.

The bulbous iris are a particularly fascinating group of early blossomers and there are many more to be sought out in special lists and tried for late winter garden effects.

Most of the bulbs mentioned in this article are grown in full sun but the following need shade. *Leucojum vernum,* the Spring Snowflake, has a very large snowdrop-like blossom, white with green tips. If I had shade in my garden I would raise many of these and would sow the ripening seed year after year to make ever-widening patches. This beautiful flower blooms in mid-February and likes a limy soil as well as shade. A later and taller Leucojum is *L. aestivum,* the Summer Snowflake, blooming from mid-April for about three or four weeks. There is a named variety, Gravetye Giant, robust and free flowering, which has much heavier-textured leaves and blossoms, far superior to the original *L. aestivum.*

The other demander of shade is a comparative newcomer from northern Persia, *Scilla Tubergeniana.* My efforts with this were unsuccessful until I saw some fine specimens grown on the north side of a building. My bulbs were then moved to a spot almost completely in shade where, through February and March, they have been in beautiful bloom for several weeks and are now heavy with seed-pods. The six-inch-high blossom spike bears delicate blue flowers with thin darker lines striping each petal. Each bulb has several blossom spikes and makes a good early season showing.

Much the size and color of the above is *Puschkinia libanotica,* the striped squill. This comes from Asia Minor and is named after the Russian botanist Count Mussin-Puschkin. It commences blossoming in March and continues for several weeks. The pale blue blossoms are striped darker and it is a cheerful grower in full sun, then sets its spikes of seed pods to strew about and widen the patch. Never brilliant or showy, there is something very pleasing about these spikes with up-facing soft-hued bells of skimmed milk color. Grow it in full sun beside a wide patch of the bright blue *Chionodoxa sardensis* for a pleasant picture. *P. l. alba* has pure white flowers.

The little Winter Aconite, *Eranthis hyemalis,* will do well in shade, although it also does well in full sun. On two-to-three-inch stems the little yellow varnished buttercups with wide green ruffs open to the February sun. Later the finely divided leaves make a pretty patch of green foliage, and if the seeds which ripen about the end of April are carefully sown near the main planting the little seedlings come up the following spring, but for the first year seem to produce the first two seed leaves only. The following year one finely divided leaf grows from each little bulblet and the third year the seedlings begin to bloom.

There are several members of the Chionodoxa, or Glory of the Snow group, and their hues of gentian blue are very beautiful. There are also to be had pink and pure white forms. Of clear, beautiful gentian blue is *Chionodoxa sardensis,* perhaps three inches high; planted thickly on a solid patch it can be very beautiful. Of the same size but with a wide white

throat is *C. Luciliae,* also most beautiful planted thickly in a sunny place. From the latter we have *C. L. alba,* a pure white form; *C. L. rosea,* a soft pink that gets even paler as it ages, and beautiful *C. L.* Pink Giant, well named with stems of extra height and robustness bearing bright pink racemes of blossoms. A little later comes *C. gigantea,* rather more lavender in tone and flowers of extra width; available also is the white *C. g. alba.* And last of the Snow Glories to bloom in my garden, always coming a little late to surprise me, is *C. tmoli* with pleasing soft pearly blue, white-centered flowers. This is never so gorgeous in color nor so long lasting as the *C. sardensis* and *C. Luciliae* groups, but nice to have to lengthen the season which begins in early March. As the flowers of Glory of the Snow fade, fat round seed pods form along the stem which leans over to rest its heavy burden on the ground. Watch these carefully. The pods will open in late April or early May, full of dark round seeds. Sow them carefully while still moist. They come quickly into bloom and one cannot have too many of these bright small treasures.

One of the Scillas has much the appearance of a Chionodoxa and is much the same color. This is *Scilla bifolia.* To tell them apart look at the back of the flower. Chionodoxa has a little tube or swelling at the back where the Scilla is flat. Mid-March sees this in blossom —my notes state that on March 11, 1951, the first spike bloomed after a snowy week. *Scilla sibirica* follows right on its heels and the brilliant green-blue of this easy favorite makes it one of the most valued of spring flowers. There is a white form, *S. s. taurica,* a clear blue, but the named variety Spring Beauty is the largest of all, being very fine and of a much deeper, richer blue than the others. This is a fine grower and increases its bulbs readily to widen the clumps. In my garden it has never set seeds as do most of the small bulbs—whether the blossoms are always sterile I cannot say. This last makes a brilliant display planted with the orange scarlet *Tulipa praestans* Fusilier.

Of the Grape Hyacinths there are some distinctive kinds. One which I like very much indeed is *Muscari Argaei album.* This has little spikes of pure white flowers and blooms many weeks from late March to the end of April. The bulb increase is very slow indeed, nor does it seem to set seeds. Other white forms are *M. botryoides album* and *M. polyanthum album.*

Muscari armeniacum is a good blue and extremely floriferous. Its variety Cantab is a gem, a most pleasing soft clear Cambridge blue, dwarfer and later than the main planting of *M. armeniacum.* It is particularly beautiful used with the Confederate Violet.

M. latifolium seeds itself about in a mild fashion and is decidedly different from any other Grape Hyacinth, both in foliage and blossom. The one broad leaf resembles a lily of the valley leaf and from its center rises the eight-inch blossom spike, very dark blue in the lower half and very pale blue in the upper half. This is the first Grape Hyacinth to bloom, coming about March 20. I have never grown or seen a pink Muscari, but from Asia Minor comes—at great price—a "Tassel Hyacinth," *Muscari Massayanum,* said to have bright pink flowers.

A very fine introduction of recent years is *Muscari Tubergenianum* from northwestern Persia. The first week in April, when this is in bud, the spike is a pure delightful turquoise, quite unlike any other Grape Hyacinth. The fully developed blossom is a clear, soft blue. It does not seem to be as prolific in blossom as other kinds and, although the blossoming stem is tall enough, the inflorescence itself is rather too short and too round to be graceful. But it has distinction, nevertheless, since it is so beautiful in its early stages of color. This does not seem to increase very fast.

Anemone blanda is one of the early blossoms and sometimes responds to the blandishments of a warm February sun, but in March the blossoms are out in quantity. Blues in various shades are available, such as *A. b. atrocoerulea,* very dark; *A. b.* Blue Star, bright

(Continued on Page 78)

Ground Covers

Mrs. Roy Anderson *

IN NATURE all plants are ground covers—from the tallest trees to the lowest creepers. But we gardeners do our landscaping on a smaller scale, so we have come to think of ground cover plants as the small, low, spreading things. Someone has suggested three feet as a height limit for what we term ground cover plants, but plants that are even lower have more ground cover uses.

Grass is the most commonly used ground cover. And where a neat, velvet carpet that will take wear and abuse is wanted, no other plant serves so well. But sometimes we have places where it is impractical or impossible to grow grass. Some trees, such as beech and maple, give a dense shade and their roots rob the soil, discouraging grass. There are hot, dry banks where grass is more trouble than it is worth. Too, grass, even where it will grow, requires a great deal of work. It must be fertilized, watered, mowed and edged—not once, but many times during the season. And we gardeners, like all other modern men, have become fools for eliminating work. Ground covers of shrubs or perennials are less work than a lawn.

Ground cover plants are less work than grass and they have characteristics of value that grass does not have. They keep the roots of valuable trees and shrubs cool in summer, they hold moisture, they keep down weeds, and in many winters such as ours of 1955-56 they protect our shrubs from the damage done by the cold. Grass is a smooth, velvet carpet. But many ground cover plants have colorful flowers or fruits; their leaves have texture; they have variety in height. In other words, they have design advantages over grass. The gardener can create effects with ground cover plants which he cannot create with grass. And in the years ahead ground covers probably will be used more and more for these design advantages rather than from necessity.

Those are some of the advantages of ground covers over grasses. On the other hand, there are disadvantages. Ground covers are harder to establish than grass. A lawn can be established in a few weeks. Most ground cover plants will take two years to cover a given area. Even those that become rampant spreaders, such as ivy, take a year to two to establish before they start traveling.

Ground covers are harder to establish and the original cost is higher than that for a lawn. Ground covers, until they are established, must be weeded by hand; no chemical weed killers here. Ground cover plants will not take the wear that grass takes. And many of them become pests if we but turn our backs. A ground cover's first asset is its ability to spread. At one and the same time, its ability to spread can be its greatest liability.

The gardener who has considered the advantages and disadvantages and decided to plant ground cover plants will need to know the mature size of the material he plants and also how rapidly it will grow. Will it cover several square feet in two years as the wintercreepers do, or will it need several years to cover two square feet as wild ginger does?

He should also know the maintenance required once the planting is established. Some, such as the junipers, properly grown, require practically none. Others, such as hypericum, require an annual or semi-annual pruning. However, with today's rotary power mowers, the matter of pruning ground covers is not the chore it once was. Set the mower blades high and shear off the untidy last year's growth. Another modern gadget to take much of the maintenance out of growing ground covers is the metal edging strips sold for use on lawns. Corral the travelers with these strips and many delightful little plants once considered too rampant to use become a joy to have instead of a chore to get rid of.

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*Mrs. Anderson, member of our "Sally Bunge" Arboretum Unit, prepared this article for her garden group. She wishes to acknowledge the invaluable assistance of Mrs. Louis Oulmonn, Mrs. W. E. Calvin and Mrs. Frederick A. Bunge.

The gardener should know the ultimate size, rate of growth, maintenance required, whether plants take sun or shade, dry or moist conditions. But there is still more.

An interesting phase of planting ground covers which should not be overlooked is the naturalizing of bulbs under them. This must be done before the ground cover is planted. And one must select only those bulbs which take care of themselves for years—wood hyacinth, crocus, grape hyacinth, narcissus, trillium, erythronium and daffodils. Remember that most tulips do not naturalize and should not be used in this way. Remember, too, that a large planting of one kind of bulb is much more effective than a smattering of several kinds. Plant bulbs in drifts, with open spaces between where none are planted.

Bulbs under the ground covers can add much to the interest of a garden. Interesting effects may also be created by mixing the ground covers themselves. They can be planted in flowing bands of contrasting colors and foliage textures. The gardener doesn't have to stick to one ground cover in a spot. The garden can be more interesting if the cover varies.

Select ground cover plants carefully, underplant them with bulbs and enjoy the results for many years. But a word of caution to the Northwest gardener in search of the proper ground cover plant. Much of the material on the subject is written by Eastern gardeners or those of the Southwest. We can grow many good ground covers that Eastern gardeners cannot, and many plants recommended for arid climates are unsuited to ours.

The list of ground cover plants is virtually unlimited. Here are some that gardeners of the Seattle area have found of value.

Ajuga reptans, Bugle. Herb of the mint family with bronze-green leaves, 6-to-8-inch spikes of blue flowers in early spring. A fast ground cover for sun or shade, simple to grow, thrives in ordinary soil. Prune it close to the ground in late winter. There are also varieties with white or rose flowers. Use it along pathways or parking strips where it can be kept under control. Naturalize narcissus or daffodils under it.

Ajuga metallica crispa. Smaller, green curled-leaved variety, glossy blue flowers on 5-inch spikes. Try it under white birch.

Anemone apennina, Windflower. Attractive perennials blooming in early spring. Sky blue flowers 1½ inches across on 9-inch stems, tuberous roots. Grow it in rich, sandy loam in partial shade. Use it in the wild border and for colonizing. Very choice.

Arctostaphylos uva ursi, Kinnikinnick. Evergreen procumbent native, bright green leathery leaves turning bronze in fall. Pink flowers, red showy berries. Grow it in full sun, acid soil, in a hot, dry situation. May be pruned if it becomes ragged. Use it with pine, heather, salal, low Oregon grape, madrona or manzanita. Plant it on top of a driveway wall to hang down and break the expanse of concrete.

Arctostaphylos media. Cross between *A. uva ursi* and the tall manzanita, *A. columbiana*. It varies in leaf size, pattern and color. Has a more interesting foliage pattern than kinnikinnick and may be used in the same way.

Asarum caudatum, Wild Ginger. Native, low herb, heart-shaped velvety leaves which are aromatic and evergreen. Chocolate-colored blossom close to the ground in June. Very worthwhile for the shady woods; requires good rich soil with plenty of humus. Slow to establish and subject to slugs. Makes a good ground cover under rhododendrons.

Asperula odorata, Sweet Woodruff. Small perennial herbs, to 7 inches, creeping stems, whorled leaves, fragrant white flowers. Thrives in moist, shady places. Will need a barrier to keep it under control.

Azalea Gumpo. Very dwarf, compact plant, 6 inches tall with a 10-inch spread. Ruffled white or pink blooms up to 3 inches across. Glistening dark evergreen foliage. Use in front of the taller rhododendrons.

Ceanothus gloriosus. Spreading evergreen shrub with rich green foliage, powder blue blossoms in spring. Grows on dry west or south slopes in full sun. Space plants 3 feet

apart. Strong, fast grower. Use it with *Cotoneaster humifusa,* with kinnikinnick or with the yellow brooms.

Coptis laciniata, Gold Thread. Little herb of the buttercup family, native to Washington. A six-inch plant with deeply divided leaflets; yellow rootstock gives it its common name. Dainty fern-like ground cover remaining green all winter. Its single flowers resemble tiny white buttercups. Grow it in shady, damp situation in peaty soil. May need to be kept within bounds.

Cornus canadensis, Canadian Dogwood. Native creeping herb, growing only a few inches high. The mats are covered with dogwood blossoms and later with clusters of red berries. Needs moist, acid soil in shade. Few gardeners succeed in growing it to the perfection we find in the wild.

Cotoneaster Dammeri (humifusa), Rockspray. The best of the prostrate cotoneasters for ground cover purposes and one that is reliably evergreen. Its branches follow the contours over rocks and down surfaces, rooting as they go. One plant will cover an indefinite area. It is slow growing, has unusually showy flowers for the cotoneasters and red berries. Grow it in sun or shade, dry or moist situation. Use it on steep banks with the low junipers and spreading brooms.

Cyclamen neapolitanum, Hardy Cyclamen. One of the very loveliest ground covers for shade. Low herb with large tuberous roots. Blooms in autumn and the mottled leaves develop after the bloom, making a winter ground cover. Leaves disappear during summer. Blossoms pink or white. Increases in beauty with the years. Plant three to a spot.

Cytisus, Broom. The low brooms are shrubs for hot, dry situations on sunny banks. Disease-and-insect-free, need no pruning, not fussy as to soil, require little fertilizer and remain satisfactory for many years. Plant them with *Ceanothus gloriosus. C. decumbens (Genista prostrata)* is the most prostrate of all, six inches high, making a golden yellow carpet in spring. *C. kewensis,* a hybrid, grows to one foot with whiplike branches covering a yard or more in diameter. Blooms in late spring with creamy white flowers.

Epimedium pinnatum sulphureum, Barrenwort. Perennial herbs with heart-shaped deciduous leaves. Form dense mats, 7 to 8 inches, with dainty yellow flowers. Veining and coloring of the leaf is particularly beautiful just as it is coming out in spring. Leaves turn bronze and last most of the winter. Grow it in shade in any good garden soil. Subject to strawberry root weevil. Good ground cover for the front of a shady border. Use it with yellow rhododendrons, mix it with salal, try it under birch.

There are other epimediums with rose or white flowers, though they are not so commonly seen as the yellow variety.

Erica, Heather. The heather family is a large group which needs a study in itself. Heathers make fine ground covers for hot, dry situations in full sun. They provide a wide range of colors and bloom time. May be had in bloom almost every month of the year.

Euonymus Fortunei var. *radicans,* Wintercreeper. There are several varieties of these evergreen procumbent shrubs which root themselves down as they trail along. Of easy culture, grow in shade or sun. *E. F. coloratus* has green foliage turning to red and purple in winter. Fine, fast grower, stands any amount of trimming and covers a considerable area if untrimmed. Plant three feet apart. *E. F. gracilis* is dense, dainty green leaved variegated with white which turns red or pink during winter. Use it on slopes or banks; one plant covers three to five feet. *E. F. minima,* a slow-growing alpine with tiny leaves.

Ferns. Many of the ferns make good ground covers, but usually their culture is somewhat difficult. The gardener who grows them needs to know the specialized conditions they require. The sword fern, *Polystichum munitum,* and the Deer fern, *Lomaria spicant,* are not too difficult. Sword fern and salal make a good ground cover under madrona. It is, however, a heavy textured plant and one can overuse it in a small garden.

Fragaria chiloensis, Beach Strawberry. The

wild strawberry makes an evergreen mat for sun or shade. Usually in cultivation it bears no fruit. May be used as a lawn substitute when it is watered, weeded, fertilized and mowed twice a year. Mowing eliminates surface runners and makes a thicker growth.

A new hybrid ornamental Strawberry No. 25 is believed to be superior as a ground cover and will produce fruit. Use wild strawberries under pines, under *Arbutus Unedo,* or mix them with grey foliage plants. Particularly recommended for binding sand on windswept beaches.

Galax aphylla. Stemless evergreen herb with heart-shaped, rounded leaves up to 5 inches across. Leaves turn shades of red and bronze in fall. Used by florists of the East at Christmas time. "One of the loveliest hardy foliage plants in existence, a thing of beauty from one year's end to the next." A ground cover for partial shade. Use it with the small salals, in the woodland garden, under rhododendrons and azaleas, but do not use it under conifers.

Gaultheria cuneata, a miniature salal. Compact, tufted shrub of less than one foot, leaves small and narrow. Fruits white tinged with carmine when exposed to sun. Native of Western China. Use it in drifts and masses below the taller ericaceous plants. Too expensive to use except in small areas.

Gaultheria Miqueliana. Native miniature salal of Japan, grows to 1 foot, produces white berries. Leaves especially attractive, coloring in fall to make a crimson mat. Handsome, and one of the best small ground covers, but also expensive.

Gaultheria nummularioides, Money Plant Salal. Another decumbent or creeping salal, native of the Himalaya. New foliage is chartreuse green, berries bluish-black; known as the money plant because of the shape of the leaves. Grow it over a mossy boulder or log in some shade.

Gaultheria Shallon, Salal. Our own native salal is one of our best evergreen ground covers. While it may be slow to establish, it is of the easiest culture in sun or shade, requiring no care and no fertilizer. Usually it requires no pruning, but when it becomes ragged or untidy it may be cut back to the ground in early spring. However, the gardener should be careful not to use too much of it in the small garden. Use it under madrona; mix it with *Mahonia nervosa* for a cover under Portugal laurel. A perfect companion for the tall hybrid rhododendrons.

Gaultheria procumbens, Wintergreen or Checkerberry, native of Eastern United States. Rich green leaves, waxy white bells and large red berries with the wintergreen flavor. Leaves turn bronze in fall and winter. A very lovely little plant, but again too expensive except for the small area.

Gaultheria ovatifolia. The miniature salal found at higher elevations in our own mountains. If the gardener wants a small salal that looks like salal, this is the one to grow, though it may not be too easy. Forms creeping mats to 8 inches and produces red berries. Grow it in the shade.

Helianthemum nummularium, Sunrose. Makes an excellent ground cover for sunny situations. Evergreen and comes in several pastel shades—peach, shrimp, white, yellow, orange and red. Needs no fertilizing unless the soil is unusually poor. Should be cut back a little each year and is long lived when so treated. Plant it with dwarf rosemary along paths and steps.

Hepatica triloba, Liverleaf or Mayflower. Little perennial woods herb which blooms early in spring. Prospers in well-drained rich soil. Flowers one-half to one inch across, lavender blue or white. Useful for colonizing and makes a sweet, lovely little mat. Very choice and desirable.

Hypericum calycinum, St. John's Wort. This is rather coarse, but useful as a ground cover in waste areas as it is drought-resistant, vigorous and may be cut with the lawnmower in early spring. Large yellow flowers from summer on. Rampant, but useful for holding soil on banks. There are smaller, more choice varieties of hypericum which are less often seen.

Juniperus horizontalis. Procumbent shrub with long trailing branches, blue-green foliage, blue fruits. Slow growing, but will cover quite an area and requires little maintenance. The variety "Coast of Maine" is said to be the best. Plant it on hot, dry banks with the heathers. Particularly good with *Azalea mollis*. Use it with *Cotoneaster Dammeri* in a drift around a rock.

Leucothoe Keiskei. Another small choice shrub on the expensive side. Glossy pointed leaves on 6-inch stems, the white flowers are rather large and bell shaped. Foliage turns crimson in fall. Grow it in the shade.

Linnaea borealis, Twin Flower. Native, member of the honeysuckle family. Flat, shining mat of yellow-green foliage. Twin, pale pink flowers on 2-inch stems in summer, very fragrant. Grow it in peaty soil in semi-shade. One plant will eventually cover two square feet. Use it in small areas where there is no traffic.

Luetkea pectinata, Alaska Spiraea. Forms a dense carpet of feathery evergreen leaves of an unusual shade of green. Creamy flowers on 2-to-6-inch stems. Grow it in semi-shade.

Mahonia nervosa, Low Oregon Grape. Native evergreen 1 to 2 feet tall, yellow flowers, purple berries. One of our prettiest native ground covers. May be grown in full sun, or shade; no insect pests and no diseases. Hard to transplant from the wild, but grows easily from seed. One of the best. Use it in a planter box. Use it with salal on an outcurve. Effective planted under the red-leaved trees such as purple beech or *Prunus Pissardii*. One of those plants that can be too strong if too much of it is used in a small garden.

Mahonia repens, Creeping Holly Grape. Low-growing native from east of the mountains. Resembles *M. aquifolium* in leaf form. Grows only a few inches high in lime or acid soil in sun or shade. Easily grown from seed. Mix it with kinnikinnick for a hot, dry situation or use it under rhododendrons.

Pachistima Canbyi, False Box. An 8-to-9-inch spreading mat of easy garden culture. Native of eastern United States. Dense, fine-textured foliage turning bronze in winter in a sunny situation. Pink blossoms in spring. A ground cover for moderate areas, does not spread rapidly. Needs little care when established. Mix it with kinnikinnick or use it in front of a rhododendron planting.

Pachysandra terminalis, Japanese Spurge. Evergreen procumbent herb to 12 inches. Foliage yellow-green in sun, dark in shade; clean, crisp, distinguished foliage. The leaf arrangement makes an interesting texture pattern. Produces white, fragrant flowers and sometimes white berries. Also a variegated form. *Pachysandra* suffers no diseases and no insect pests. Cover for full or sheltered shade; best grown in rich, acid soil with plenty of moisture, but it will grow and look well under beech and maple trees. Plant rooted cuttings 6 to 8 inches apart. Shear the tops with the lawnmower every two or three years. Plant daffodils and narcissis under it. Use it with rhododendrons or *Pieris japonica*. A wonderful ground cover under cedar.

Penstemon fruticosus, Beard Tongue. Prostrate shrub 1 foot high with a spread of 10 feet. Erect lavender flowers. Of easy culture for a hot, dry situation.

Penstemon rupicola. Low evergreen native of high altitudes. Grey-green leaves, ruby flowers. Very easy to grow and one of the choicest for semi-arid area in full sun.

Penstemon Tolmiei. Four-to-six-inch tufted perennial, blue-violet, fragrant flowers.

Pernettya rupicola. Small-leaved ericaceous evergreen, very dwarf. Berries red and smaller than those of *P. mucronata*. Grow it in full sun. Use it with Mrs. Maxwell heather.

Potentilla Tonguei, Cinquefoil. Trailing herb with apricot to orange flowers. *P. cinerea* has golden yellow flowers on matted yellow green foliage. *P. villosa,* grey foliage plant not unlike strawberry, yellow flowers. Grow it in sunny situations.

Primroses make good ground covers for light woodland situations. Their leaves make an interesting texture pattern when they are not in flower and in flower the possibilities for using in color combinations is almost limitless.

(Continued on Page 76)

Saving the Redwoods

AUBREY DRURY *

IN Northwestern California, where the Redwood Highway leads for many miles through lofty colonnades of trees, a panoramic perspective strange and unusual is presented. Russet-fluted trunks rise in sheer straightness, perfectly poised, ponderous columns often devoid of foliage for a hundred feet above the forest floor, where native ferns, shrubs and flowers are massed in lush luxuriance. Many of the redwoods along the Avenue of the Giants are over 300 feet tall and more than 2000 years old.

Above-head, the branches interlace in ever-shifting tracery against the sky. In the morning and evening long shafts of sunlight stream down through lofty arches of foliage.

Of these finest of the redwoods, Duncan McDuffie wrote: "To enter the grove of redwoods on Bull Creek Flat is to step within the portals of a cathedral, dim, lofty, pillared, peaceful.

"But this temple which the Great Architect has been building for a score of centuries is incomparably nobler, more beautiful and more serene than any erected by the hands of man. Its nave is loftier than that of Amiens and longer than that of St. Peter's. Its wine-red shafts, rising clean and straight over two hundred feet, are more numerous than the pillars of Cordova; its floor is carpeted with a green and brown mosaic more intricate than that of St. Mark's; its aisles are lit with a translucence more beautiful than that which filters through the stained glass of Chartres; its spires pierce higher than those of Cologne; its years are greater than those of the first lowly building devoted to Christian service.

"To destroy this noblest of places of worship would be more irreparable than was the destruction of the cathedral of Rheims."

When the living wilderness of the Bull Creek-Dyerville region was preserved, the *Saturday Evening Post* commented editorially: "A great scientist has said that this primitive forest seems like a fragment of the Garden of Eden coming to us directly from the hand of the Creator. Certainly such a grove expresses life in one of its most splendid forms, and is an outstanding example of the superlative in the world of living things."

One of the tallest of all known standing trees is the spiring redwood—347 feet high!—on North Dyerville Flat east of the Redwood Highway in the Founders Grove, near the Dyerville Bridge. This monumental Sequoia is called *The Founders Tree,* in honor of the founders of the Save-the-Redwoods League.

The substantial gifts from many organizations and individuals which have been made through the Save-the-Redwoods League in the course of a quarter-century represent an outpouring of public spirit and generosity truly notable. Sentiment indeed has had its part; yet down the forested aisles of the redwood groves now triumphantly saved might be breathed an echo of the admonition of Theodore Roosevelt when he said: "I appeal to you to save these mighty trees, these living monuments of beauty—there is nothing more practical in the end."

From its early years, the Save-the-Redwoods movement has been greatly aided by the establishment of memorial groves through gifts by public-spirited individuals and groups. These groves are incorporated in the State Park System, to be held safe in perpetuity.

Memorial groves established recently in the Avenue of the Giants area, by generous gifts to the state through the Save-the-Redwoods League, are noteworthy.

On the western bank of the South Fork of the Eel River where the redwoods attain superb grandeur, the Garden Club of America Redwood Grove is outstanding. To the south lies the beautiful Children's Forest, "a common memorial to children."

Though preservation of the most essential parts of the League's four major projects in

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The Arboretum Bulletin

VOL. XX, NO. 2 SEATTLE, WASH. SUMMER, 1957

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Special Notice

To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears will be dropped and THE BULLETIN will be discontinued.

Arboretum Membership Blank

☐ Active	$ 5.00
☐ Contributing	10.00
☐ Supporting	25.00
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☐ Sponsor	100.00
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The Arboretum Foundation,
University of Washington Arboretum
Seattle 5, Washington

I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

Name .....

Address .....

All memberships are non-assessable.

Notes and Comment

ABOUT THE BRIDGE

From inquiries we have had from members and friends of the Arboretum, we are sure you are all interested in the progress of our fight to preserve the Arboretum from encroachment by the proposed Evergreen Point bridge.

You will recall that the Governor announced that a New York firm would make a study to see whether a crossing from Evergreen Point to Montlake (through the Arboretum) would be financially feasible. Your Foundation wrote him urging him to have a simultaneous study made of the parallel bridge location, thus saving time. He replied that they were going to make a study of the Evergreen location first and, if not financially feasible, then they would make a study of the parallel crossing.

The East Side Bridge Users Association held what was called a "Victory Dinner," attended by the Governor and members of the Highway Commission and Toll Bridge Authority. He praised them for their determined fight for their location, but, strangely, made no mention of the western approach. It was quite a political speech and was carried on television. Mayor Gordon S. Clinton and John D. Spaeth, Jr., of the King County Planning Commission, were in the television studio and made it very clear that they are standing by their declaration that a second bridge, which they strongly urged, should be built as a parallel span, connecting with Federal Highway No. 10, the cross-state highway. This would make it eligible for federal assistance, which the Evergreen bridge could not receive.

Our fight to save the Arboretum is being closely watched by friends throughout the country; the following is quoted from an article by Dr. John C. Wister, director of the Scott Horticultural Foundation, Swarthmore, Penn., in the May issue of the *Bulletin of the Garden Club of America:* "The beautiful University of Washington Arboretum in Seattle, which belongs to all the people of the state,

has been slashed once. A threatened second slashing has been held up for several years by protests so numerous and from such influential sources that the matter has not been decided."

C. M. B.

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At the suggestion of the Foundation, Mayor Clinton proclaimed the month of May as Rhododendron Month. The Seattle Rhododendron Society had a very excellent Rhododendron Show in Bellevue May 16 through May 19. As the Arboretum's display of these magnificent shrubs was at its best, our hard-working Units arranged for hostess guides to be on hand each day that week. Hundreds of beauty lovers took advantage of the opportunity of seeing what we had to show. One interesting note on the visitors' register was made by Mrs. L. Kerber, Braunschweig, Germany, who wrote beside her name, "Seattleites are very fortunate, the Arboretum is one of the loveliest parks I ever saw."

✓ ✓ ✓

IMPORTANT DAYS TO COME:

September 26 has been set aside this year as "OPEN HOUSE" day at the Arboretum.

Thursday, October 10, Arboretum Unit PLANT SALE at the Arboretum.

✓ ✓ ✓

The Annual Lily Show of the Puget Sound Lily Society will be held July 11, 12 and 13 at the Frederick & Nelson Auditorium. Show will be open during regular store hours. Exhibits may be entered by any lily grower whether member of the Society or not. Contact Mrs. Fred S. Pretzer, 3212 South 136th, LOgan 2813.

The Arboretum Unit Council recently donated $1,400 to the Arboretum for additional labor and maintenance.

✓ ✓ ✓

Stewartias

(Continued from Page 52)

leaves. This flower opens more fully showing their huge cluster of quite vivid purple stamens which gives the flower depth in appearance. The third I would recommend for our gardens here is *S. malacodendron.* This is a native of the southeastern United States and, though not considered entirely hardy here, has withstood many severe winters. Planted where it is protected from winds and winter sun scorch which can damage the bark it should add a most distinctive quality to the garden scene. The leaves appear in spring in a very light green crinkled manner and become by early summer quite large. This is the largest flowered kind with fully open loose petals with serrated edges. The numerous stamens are bright purple, giving an orchid cast to the silk crepe white petals.

Unless purchased in cans or balled it is best to wait until late fall or very early spring to plant them out for any root disturbance will retard and sometimes kill them if not quite small. Care to give them ample moisture with good drainage is essential and especially during the first years while their root structure is developing. A mulch in summer is one way of protecting the ground from becoming too warm. In their native habitats they grow in woodland and so need no protection. They can be so placed here but the flowering will be much less and the autumn will find they do not color as well.

Some Recent Purchases with Donated Funds	*Source*
Plant of Camellia "First Flush"	Amateur Gardeners
Trees of flowering plum, magnolia and willow	Lake Washington Garden Club, Unit No. 2
Four plants of hybrid rhododendrons	Relatives and friends of the late Harry W. Smith
Three plants of rhododendron "Blue Peter"	Seattle Rhododendron Society
Two upright birch trees	Washington State Federation of Garden Clubs
Eleven plants of lilacs	Arboretum Unit No. 3 (Gene O'Brien)
Collection of new plants, imported from England	Arboretum Unit No. 39 (Arboretum Amateurs)
Three volumes of Curtis' "Botanical Magazine," (1938-40)	Arboretum Unit No. 41 (Frances Macbride)
Three plants of *Rhododendron lutescens*	Arboretum Unit No. 55 (Sally Bunge)
Collection of new plants, imported from England	Arboretum Unit No. 61 (Herbert Ihrig)

ARBORETUM NOTEBOOK

This section is particularly designed for notes, information and queries concerning beautiful or unusual plants from growers of all types or experience. We solicit your remarks and ideas, but space limitations may sometimes restrict us to publishing those of the widest interest.

GARDEN HINTS . . .

JULY—AUGUST—SEPTEMBER

Routine (Good Housekeeping)

Remove all old blooms.

Remove all seed pods.

Water regularly and well.

Spread compost where necessary.

Fertilize.

Spray.

Watch for and remove morning glory (bindweed), horsetail and bracken.

Stake chrysanthemums, dahlias, phlox, Michaelmas daisies and all tall lanky perennials. Stake lilies when necessary. Cut back delphiniums to make them bloom again this fall. The last of August stop watering all shrubs in order to ripen and harden this season's wood. This helps the shrub to become dormant before freezing weather.

Continue spreading compost in dry places.

Fertilization

There are special fertilizers available now, one for roses, one for lilies and one for rhododendrons and azaleas. Each contains the food most necessary for the shrubs designated.

Make a habit of feeding the fifteenth of each month. Many growers make alternate feedings of fish fertilizers and water-soluble chemical fertilizers containing trace elements necessary to plant growths.

In September feed trees with a bone-meal fertilizer in holes eighteen inches deep, sixteen inches apart made in a circle under branch-spread.

Fertilize lawns in August or September with low-nitrogen or an organic fertilizer.

Spraying

Spray for weeds in paths and lawns.

It is best never to spray when blooms are fully open. It kills the bees and it may destroy the bloom.

Spray early morning or evening.

Spray evaporates quickly in bright sunlight and may leave brown spots on leaves.

For sucking insects, such as aphids, Nicotine Sulphate and Black Leaf 40 are still used effectively. DDT kills the "Lady Bugs" (the beneficial beetles that keep aphids from infestations of gardens). Keep after slugs and strawberry weevils. It is an all-season job! Slug bait containing metaldehyde attracts slugs and kills them. For strawberry weevil use baits containing aldrin or lindane. Work dust into soil around plants or if liquid is used drench the soil with solution.

A clean garden—one with all trash (dead leaves, etc.) removed—reduces the hiding places sought by crawling insects.

Pruning

Summer pruning of deciduous trees is important when training them to any desired growth or shape.

NOW: The tree has stopped growing.

Sap is running down.

Wounds will be drier and will heal faster.

Water sprouts and sucker growths are discouraged.

Summer pruning will produce more flower and fruit next season.

Prune *Prunus, Malus* and *Pyrus*.

Prune after blooming: climbing roses. Remove all dead and superfluous wood.

Prune all summer: Wisteria; remove tendrils, runners and seed pods.

Prune Spanish Broom, lightly.

Lavender; cut off all bloom.

Heathers, July and August blooming varieties; snip off ends of twigs.

Prune lightly in August: *Deutzias, Weigelas, Kerria, Philadelphus* and evergreen *Ceanothus*.

Propagation

Magnolia—Take cuttings from mid-June to late August according to condition of wood. Use short, firm shoots.

Azaleas — Deciduous varieties difficult to root. Evergreen varieties. In early July take cuttings of current growth.

Camellia—Through August and September take cuttings six to eight inches long with three nodes. Cut leaves in half. Success varies with varieties.

Cornus florida rubra — Take cuttings through June and July.

Cistus—Take cuttings in July and August.

Heather—Small, half-ripe cuttings in July and August.

Holly—Take cuttings in August and September.

Reference Books in Arboretum Library

Fertilization. See advertisements in BULLETIN.

Spraying. "Garden Enemies," Cynthia Westcott.

Pruning. "Pruning Is Simple," John and Carol Grant.

Propagation. "Propagation Practices," James S. Wells.

Back numbers of ARBORETUM BULLETIN.

* * *

A Letter from Eastern Washington

It has been several years ago—possibly six or eight—that I wrote and asked you to advise me how to grow rhododendrons like those you have over there on the coast. You answered by telling me to let you know if I ever succeeded in growing them east of the Cascades. I was living in Colfax, Wash., when I wrote you for advice. I am now living sixty miles south and east of Colfax at Lewiston, Idaho—at the confluence of the Snake and Clearwater Rivers.

I purchased rhododendrons from Wayside Gardens, Mentor, Ohio, and they called them Hybrid Rhododendrons in this catalog. It seems that it is most important in this area to plant rhododendrons in a shady spot and to pack rotten spruce needles around the roots of each plant in liberal quantities. I went up on the mountain, forty miles or so from Lewiston, dug up leaf mold, decayed pine needles and lots of moss. I filled a deep trench along the north side of my home with these and put in my rhododendrons—covered them with the same material only many more needles. Every year I go to the mountains and bring back from under the spruce trees soil that is formed by rotted needles. This seems to give rhododendrons great strength as it is the type of earth in which they grow in the forests of Western Washington.

Mr. Charles A. Fite, president and agronomist for the North Chemical Company, Lewiston, has formulated a special rhododendron fertilizer which we apply to these plants twice a year. As far as we know, we are the only growers in Lewiston who have had any first-class success in raising rhododendrons. We believe that it is largely due to the use of Mr. Fite's special fertilizer.

It is important to water rhododendrons very liberally every day. On hot days it is helpful to spray them with water from time to time to keep them cool, as they are not very resistant to the extreme heat which we have here in Lewiston.

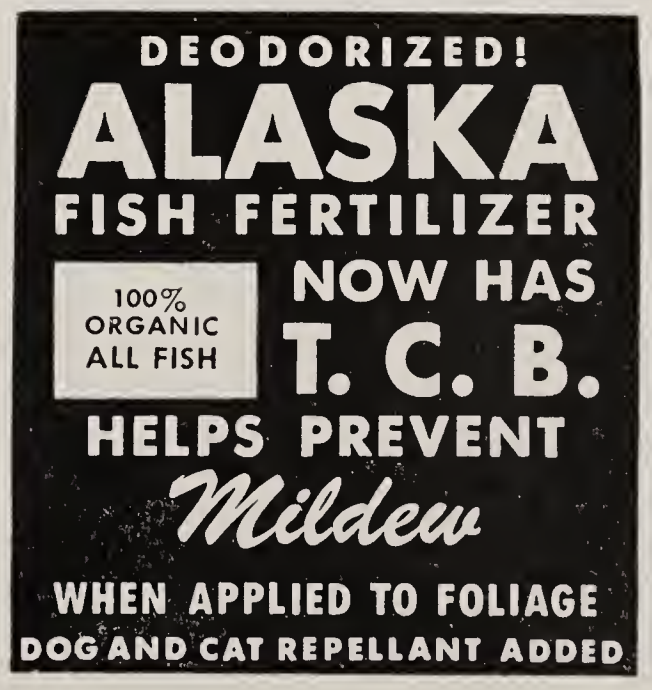
On November 6, 1955, the temperature dropped to 10 degrees, killing all the rose bushes in this community, and a great many fruit trees. The rhododendrons showed very little, if any, winter damage.

The rhododendrons are two years old now and this summer the blossoms were lovely. They also lasted a long time.

Very sincerely,

MRS. PAUL C. KEETON

102 16th Ave., Lewiston, Idaho



BOOK REVIEWS

Broad-Leaved Evergreens for the Central Midwest. Missouri Botanical Garden Bulletin, Vol. XLV. Feb., 1957, No. 1.

THIS bulletin first erects a few guide posts for the middle western gardener who hopes to include broad-leaved evergreens in his shrub plantings. A definite climatic area limits the selections which follow. Drawings by Mr. Edgar Denison, and some photographs, clarify the descriptions of plants nominated for successful culture within this area.

The terse cultural hints offered for each species or cultivar listed would prove helpful to gardeners in other areas. Some of the selections are quite surprising. Since these choices are unexpected, they seem to indicate the constant commendable effort in the midwest as elsewhere to increase the scope of landscape material in general use, by learning from experience and practice the special culture necessary for success.

FRANCES KINNE ROBERSON

* * *

The Book of Flowering Trees and Shrubs, by Stanley B. Whitehead, illustrated by Joan Lupton. F. Warne & Co., London and New York, 1956. Price, $3.50.

THIS "compact and instructive guide to the identification and choice of flowering trees and shrubs" is just that — with an amazing amount of information packed between its covers. Arranged alphabetically according to the botanical names, it gives the family, genus, outstanding species and recommended varieties. There are 240 genera represented in the 62 color plates, and the numerous line drawings include some which illustrate certain terms in the glossary.

"Compact" it certainly is, but this is a mixed blessing since its compactness is achieved by the use of very fine type. It is small enough to be carried about (but don't forget your reading glasses) and could be most helpful in the Arboretum or a nursery as well as in your own garden. The general information on soils, situations, planting, propagation and the care of those species described make this little book most worthwhile for the amateur gardener.

PAT BALLARD

* * *

Spring Wild Flowers of Southeastern Washington and Northeastern Oregon, by Chester E. Horner and Ernest S. Booth. Walla Walla College Department of Biological Sciences, College Place. Washington. (1953). Price, $1.50.

THE authors state that the purpose of this little book is to stimulate interest in flowering plants. It is designed for the use of persons without technical training, and I think fulfills its purpose very well.

Plants are keyed out into families and again into genera and species. Genera are arranged alphabetically within the family, a definite aid to the novice. Beautifully clear drawings illustrate the botanical terms necessary for the use of the keys, and detailed instructions are given for the process of keying down a plant. All species are illustrated with line drawings, and many with photographs as well. The line drawings are excellent, but the photographs could be clearer and seem to have suffered in reproduction. However, between them one would have no doubt as to the correct identification of his plant. Descriptions of the species are given, and also common names.

Special attention has been given to *Lomatium*, an interesting and difficult genus often slighted in this type of manual. I was disappointed to find so few of the species of *Penstemon* dealt with; but perhaps they bloom too late to qualify as spring flowering plants. My only regret—I can hardly say criticism—is that, having whetted our interest with the spring bloomers, the authors did not choose to deal with the rest of the year as well.

Wild flower lovers will find this little book most useful, not only within the limits of the region defined but also in adjacent areas of Washington and Oregon.

J. G. W.

* * *

The Rhododendron and Camellia Yearbook—1957. Royal Horticultural Society, London, 1956. Price $1.65, including postage.

THE eleventh issue of this useful annual publication contains, as usual, sufficient variety of material to provide something of interest for almost all tastes in these two major plant groups.

American readers will, perhaps, most appreciate the reprinting of much of Dr. H. T. Skinner's fascinating story of his extensive collecting trips in 1951—"In Search of Native Azaleas"—which originally appeared in the pages of *The Morris Arboretum Bulletin* in 1955, together with a number of his photographs. The report of an investigation into the occurrence of the Oregon azalea *(R. occidentale)* on a highly alkaline soil in northern California is also of local interest to Pacific Coast readers, although here in the Northwest we are not normally affected by such problems.

On the other hand, we can feel most sympathetically towards those garden owners in the south of England who suffered so severely from the effects of cold weather and drought in the winter of 1955 and spring of 1956, as recorded here in some detail. The damage in some instances seems to have paralleled our own experience in Seattle, although in others it was apparently less severe. The data on the comparative hardiness of E. H. Wilson's Fifty Kurume azaleas forms a valuable record for those who grow these plants.

"The Raising of Rhododendrons from Seed," by Francis Hanger, and "The Cultivation of Dwarf Rhododendrons as Pot Plants," by Dr. James Davidson, are practical articles, although the latter method is probably little used and scarcely necessary in this region.

Mr. Hanger's descriptions of the several forms of his new yellow hybrid "Moonshine" ("Adriaan Koster" x *R. litiense)*, together with the color plate, will whet the appetites of those who have a penchant for this hue in rhododendrons.

In the Camellia section a symposium on "My Five Favourite Camellias," from ten world-wide authorities, indicates that the old varieties, "Adolphe Audusson," "Donckelarii" and "Mathotiana" get most votes, while "J. C. Williams" is the most popular of recent introductions. However, thirty out of the total fifty names received only one vote each, which suggests that a wide choice is available for various climates.

Prof. E. G. Waterhouse again corrects some errors in Camellia names or spelling and tells of their histories—an invaluable service to all growers—while two short articles are devoted to unravelling the origin of the English hybrid "Salutation."

For botanists there is a full description of a new genus in the Camellia family—*Yunnanea*—and its single species, Y. *xylocarpa*, from southern Yunnan, China; this is reprinted with an illustration from a Chinese publication. Descriptions of both rhododendron and camellia shows in London and elsewhere, and of new varieties and those receiving awards, are also included. The numerous illustrations of high quality add greatly to the value of this latest yearbook.

B. O. M.

* * *

Woody Plants for Walls in Western Washington

(Continued from Page 51)

shapes. In order that our creations may look their best under these circumstances we must give them extra care.

We have found that the one-story house with wide overhanging eaves is an unsatisfactory place for the larger-growing trees and shrubs *en espalier,* for two reasons: (1) The base of the plant seldom gets water, even in winter, and (2) as soon as the shrub or tree attains a height within two or three feet of the overhang, it begins to try, and usually succeeds, to grow out away from the wall towards the light. All too often wall plants are planted in a small hole in the pavement at the base of the wall and one marvels at how they can grow, let alone survive such situations. Doubtless the heavy top loss of ornamental vines experienced by some in 1955 can be blamed on the complete negligence of the root needs in such locations. These wide-spreading, cherished plants whose roots were planted in small holes in walks or terraces just had not had or could not get enough nourishment to give their overbalanced tops the strength to resist sudden extremes in temperature.

A large, deep hole full of the best possible planting mixture is a prerequisite. Plenty of extra water in summer and foliage feeding will be rewarding. Constant surveillance for insects and diseases is demanded, for, bear in mind, your wall shrub has been deprived (by you!) of at least four-fifths of its branches and foliage, and every leaf counts.

Perhaps the rigors of 1955 (June and November) have taught us the results of too much growth-producing nitrogen feeding, or at least not enough of the other elements known to be needed by sturdy, healthy plants. We would do well to experiment with recently introduced trace element foods to help build up cell strength and resistances. Perhaps the pH factor is misleading and trials might show a greater tolerance to climatic changes where the soil is a trifle less acid. Only painstaking experiments will tell us the truth about cell structures, nutrition and resistances and their inter-relationships, and since our state experiment stations have no funds for field trials with woody ornamentals, it will be a challenge to the individual gardener and grower to do the experimenting. And while he is experimenting he can have all the fun of growing wall plants in enough variety to give year-round effect and succession of bloom and color; he can create a new dimension in his garden picture and learn how wondrously and remarkably these friends of the plant world respond to his mistreatment and loving care!

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Ground Covers

(Continued from Page 68)

Rhododendron species also make good ground covers, especially in front of the taller hybrids. But, like heather, the field is so large as to need a study in itself. *R. Williamsianum* and *R. pemakoense* are especially suited for ground cover use.

Rosmarinus officinalis prostratus, Dwarf Rosemary. Fifteen-inch shrub with a 4-to-6-foot spread; dark needled leaves, white underneath. Blue flowers in April or May. Needs well-drained, rocky soil, not too rich, in full sun. Plant it with the Sunroses along paths and steps.

Rubus pedatus, Trailing Raspberry. Native of our higher altitudes, very slender trailing plant, white flowers and edible fruit of two to six large drupelets. Not available except as it may be collected, but well worth searching for. Grow it in semi-shade.

Sarcococca Hookeriana humilis, Vanilla Plant. Low-growing evergreen, 1 to 1½ feet. Handsome shiny leaves 2 inches long. Fragrant white flowers in February, black berries. Use it with aucuba, rhododendrons, camellias, skimmia or *Pieris japonica*. Shear it to keep it low.

Saxifrage, London Pride. The saxifrage family contains many plants from the large *Bergenia* to the dwarf *S. umbrosa nana* which make good ground covers. Most of them have dainty sprays of pink flowers in spring. Interesting leaf patterns when not in flower.

Schizocodon, Fringe Bell. Alpine, growing a few inches high. Leaves are rounded and coarsely toothed. Flowers deep rose or white, fringed, one inch across, 4 to 6 on a stem. A plant with lots of color and style. Grow it in shady situations with leafmold and humus. Mix it with the miniature salals. Very choice.

Shortia galacifolia, Oconee-Bells. Evergreen stemless herb with creeping rootstocks, 3 to 4 inches tall. White bell-shaped nodding flowers on 8-inch stems. A lovely plant, makes in time a crowded mat of lacquered leaves. In fall and winter it takes on lovely tones of coppery rose and crimson. Plant it in the shade and give it plenty of leafmold and humus. Use it in the woodland garden.

Spiraea Normanii, Dwarf Spiraea. Deciduous ground cover 7 to 8 inches. Grows in good garden soil, but needs plenty of moisture and a sunny exposure. A compact, small, rounded bushlet with pink flowers much like those of Anthony Waterer, but smaller. Particularly good for its brilliant fall coloring.

Thyme. Aromatic herbs with green or grey woolly leaves. There are varieties with red, white, lavender or pale pink blossoms. They form mossy mats in full sun to bloom in summer. As a rule, they grow in poor soil and withstand neglect. May be fertilized every two years. Once established, thyme has a tendency to hump up, but may be cut with the lawnmower now and then. May be used as a lawn substitute in small areas, but is not neat enough for large ones. Use it on banks, especially good on paths and between stepping stones. Fragrant underfoot. A ground cover meant to be walked upon.

Vaccinium ovatum, Evergreen Huckleberry.

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Evergreen native of our own woods. Grow it in sun or shade in poor soil. Use it with the heathers, azaleas, species rhododendrons.

Vaccinium Vitis-idaea and *V. V. minus,* Lingonberry. Neat, tidy evergreen shrubs, 8-12 and 4-5 inches. Pinkish white flowers, edible red berries. Form mats, in sun loaded with berries, in shade there are few. One of the best ground covers for acid soil with moisture. They are excellent for their foliage alone, but in flower and fruit especially so. Unexcelled for rhododendron ground cover.

Vancouveria hexandra. Native deciduous ground cover, daintier than epimedium. Delicate feathery leaves, creamy flowers on 18-inch stems. Grow it in shade. Use it to break up plantings of heavier ground covers; use it under trees, under rhododendrons. *V. planipetala (parviflora)* the evergreen variety is a little smaller, flowers are small and cream.

Vines. Make good ground covers for certain situations. Some are handsome, they are inexpensive, and they cover large areas. Mermaid rose is almost evergreen, large, cream colored single blossoms in bloom most of the summer. Needs little pruning. Can be used on steep banks. *Clematis* may also be used as a ground cover. It requires rich soil, moisture and lime. The roots should be planted in cool shade and the vine allowed to run out into the sun to bloom.

Violets and *Violas* come in many varieties and flower colors. Some require shade, some will stand sun, some die back and others are hardy. As ground covers they offer many interesting possibilities. Violas need regular pruning and may be cut with the lawnmower. Blue or purple violas are good planted under pink roses or under the red photinias.

* * *

Appropriately in line with Mrs. Moffett's article (Page 55) there will be an exhibit of bonsai miniature trees at the Seattle Art Museum July 9-14 selected by Mr. Kelly H. Nishitani with Mrs. Stephen Richardson in charge of the exhibit.

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Some Delightful Small Bulbs

(Continued from Page 63)

blue; *A. b. scythinica,* blue outside and white inside. For a short time I had the white *A. b.* Fairy, which is a small grower with cushions of especially bright light green leaves. A pink form is available, *A. b. rosea.* The foliage of this beauty comes up a lovely dark red which makes the plant especially interesting; the blossom does not seem to be so large as *blanda.* A deep rose-red is Charmer. Once these are planted in a bed rich in leaf mold and in full sun, leave them alone and they increase in beauty each year.

Another Anemone, robust and hearty, is St. Bavo, which is on the order of the St. Brigid group but has *A. fulgens* blood. The range of colors is very wide and it seems to be very hardy, coming up year after year unfailingly. The blooming period is said to be from March into the middle of May, but locally the blooming period seems limited to a few weeks in April. This is a very fine anemone and lasts in the garden many years.

Of the Corydalis clan *C. solida,* a little magenta nonentity of early February stays with me unfailingly and pops up in unexpected places, even though I try to corral it in one spot. Not unlike a tiny bleeding-heart, with the same finely divided small foliage, it has not yet been a nuisance. Far grander is a 15-inch beauty I once had, *C. nobilis,* a species from Siberia with large clusters of yellow blossoms, black-tipped, in late April and early May, and beautiful gray ferny foliage. One to try when available is a newer one from Kashmir, an early blossomer, too, *C. diphylla,* which is said to be white tipped with purple. There may be others worth searching out. However, this group harbors many that have not much attraction.

The Crocus lists contain many fine species. The soft lavender Vanguard with pearl-gray exterior is early and most beautiful. An early spring picture of considerable charm is made by planting this crocus in groups about *Rhododendron mucronulatum;* include groupings of *Scilla Tubergeniana* and off to one side early blossoming lavender-pink heathers. A great favorite is *C. Tomasinianus,* a soft lavender in February, and this is now supplemented by color variations such as Barr's Purple, Taplow Ruby, Whitewell Purple and many others. None can be more beautiful than the original *C. Tomasinianus* which blooms unfailingly year after year and loves to grow with its bulbs tightly packed together in undivided clumps. *C. ancyrensis* is a little bunch-flowered yellow in January. *C. chrysanthus* now harbors many named varieties such as Snow Bunting, pure white in early February; E. A. Bowles, a distinctive yellow, said to be one of the most gorgeous crocus in existence; Blue Bonnet, and many others.

The autumn flowering true crocus are also interesting, especially *C. speciosus* Oxonian, a deep blue in late September.

A little bulb that persists without much care is *Hyacinthus azureus* with short blue domes in earliest spring. This is sometimes called *Muscari azureum.* The white form is also very nice.

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Another faithful standby is *Triteleia uniflora,* now more properly placed in the genus *Ipheion.* This has pale lavender or pure white abundant stars very early in the year. Curiously, the leaves, if bruised, give off a strong onion odor. At the west end of the Arboretum greenhouse and nestled against it is a fine clump of this South American bulb.

The tulip list of species is extensive and one may have many small treasures for early spring; *T. chrysantha,* about eight inches tall, yellow with reddish exterior, has the maddening habit, after its first year or two of bloom, of running about underground and sending up a leaf here and there, forgetting to blossom again. It is a lovely thing. On much the same order of blossom, but staying obligingly in one place, is *T. linifolia,* also eight inches, with flowers of a most brilliant red—even the flower stems are red toned. We are all familiar with *T. praestans,* of sixteen inches, bright red, but perhaps more interesting is its hybrid, Fusilier, dwarfer (ten inches) and an intense shade of orange red with several flowers on a stem.

T. Kaufmanniana is one of the early blossoms of spring. Early in March this year the large soft yellow blossoms expanded to be visited by the earliest bees. Yet some of the Kaufmann hybrids are even more exciting. The colors are vibrant, uplifting, the flowers large, short stemmed. They come so early that the biting chill of winter is still in the air, yet the blossoms give us wondrous early color. A large bed planted to these early blooming hybrids elicits exclamations of "Tulips? Already?" Of these most alluring *Kaufmanniana* hybrids try these: Elliott, eight inches, one of the very earliest, most beautiful large flowers, white inside, bright red outside; Magnificent, large pure white, exterior rose-red; The First, very early white with an exterior broad band of red; Gluck, nine inches, soft yellow, exterior soft red and most beautiful brown stippled foliage; Vivaldi, twelve inches, creamy yellow with rosy exterior and brown stippled leaves. Fritz Kreisler and Lady Rose are a particularly beautiful soft shade of pink. So many of these hybrids are pouring into the market that almost any we choose will be most gratifying in early spring. There are many, many delightful species Tulips which must necessarily go unmentioned in a short article. But do not miss late blooming *T. Marjoletti,* twenty inches, soft primrose with pinkish outer markings. This is one of the last of my species to bloom, lasts long in the garden and is charming when cut.

One does not need a rock garden for these small bulbs. Grown in groups in the flower or shrubbery border, many are most successful, especially if late flowering annuals such as single asters are sown over them in April or May. Grown in straight rows in the cutting garden, they will supply many a small vase with material when early flowers are still scarce.

An older and well-established planting of any of these small bulbs seems to bloom much earlier than one made the previous fall. Therefore, if they are doing well do not disturb them frequently.

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Arboretum and Botanical Gardens in the Field of Plant Sciences and Human Welfare

(Continued from Page 47)

He or she may be a person, or a part of the personality of some or all of the garden staff. Without this aspect represented at the garden, the situation is cold and the public is not interested.

By all means, no small part of this seeming calamity is due to "inflation" and higher wages without compensatory increases in income for most botanic gardens. "Inflations" and increased costs of salaries and operation have affected most of our public gardens, particularly those endowed many years ago and without adequate capital replacement reserves. These either have faced or will be forced to face methods of refinancing. Some of the newer ones have been quicker to refinance and probably have better financial security now than ever before. It would appear that where there is a will there is a way—if the proper way is used for the particular community in which the institution is located. The financial rejuvenation of a few arboreta and botanical gardens, both public and private, in widely separated sections of the country leads me to believe that in general the public approves of more and better public gardens and therefore the positive approach must be assumed and refinancing must be faced, otherwise we must lose enthusiasm and ambition on the part of the younger generation to work toward botanical garden careers. Just because a man or woman wishes to work in some capacity in a botanical garden is no reason to assume that he or she should not receive a salary comparable to "industry." Low and out-of-line salaries in this day and age only force the interested and qualified into second-choice better-paying fields of botanical sciences or completely away from plants entirely. The administrators of some of our gardens, facing economic ruin, must seek means of support which may sacrifice the appearance of their garden. The appearance of the arboretum or botanical garden and the quality of its plants and plantings must be kept first and foremost in the eyes of the administrators, employees and the public just as the quality of food and appearance of the restaurant must be maintained at your favorite "eatery." Without that the first requirement for public and private support is lost.

Many of our public gardens, formerly surrounded by beautiful countryside or fine residential sections, now find themselves in the middle of the poorer section of town, off the beaten track or in a pall of industrially polluted air so bad that only certain human beings continue to live there. Regardless of the location of any garden—if it is worthwhile seeing, people will come to see it. An arboretum or garden should be considered a permanent part of the community. Its surroundings will change from good to bad and perhaps eventually to good again. I think that a recent enlightening experience is worth relating. On the island of Jamaica there exists a small but charming garden called the Bath Botanical Garden in the town of Bath near the southeastern corner of the island. This botanical garden, the first on the island, was started in 1779. It is located in the center of a small, crowded settlement of poor people and poorly maintained houses—yet, through the turmoil of life, events, generations, battle, hurricane, earthquake and flood this garden shines out a splendid example of the love,

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appreciation and value of a botanic garden. Here, off the beaten track, in poor surroundings, and mellowed with age, it is clean, beautiful and respected by the residents as a shining example for all botanic gardens.

Industrial and civic air pollution is a phase we are going through in rapidly growing industrial and population centers. Some of the best factual evidence that we have to prove the presence of air pollution may be found at the botanical gardens situated in such conditions. As we gather our evidence and the force of the public's opinion gathers weight, air pollution will become as bad an offense as polluting water and milk. Measures have been taken, can be taken and will be taken to clean it up—the botanical garden can help a great deal by assisting our authorities in proving damage caused to plants grown in the presence of polluted air and by further publicizing specific damage to specific plants to the gardening public.

Many gardens suffer the constant pressure of encroaching "civilization" and the march of the bulldozer preceding highways, subdivisions and what not. The encroachment of civilization on the privacy and serenity of the botanical garden is one of our most serious problems. We all realize that we cannot prevent the advance of civilization—but by the same token there is no excuse for the planner to point his finger at the botanic garden with an "it's got to go" attitude. Public opinion is the best tool by which this attitude might give way to fair consideration. There is no way in which the valued specimens of many a threatened garden can be replaced, except by bodily moving many of the time-honored specimens to a new location. I'm sure that were the public authorities forced to dig up the funds for such operations they, too, would look upon the value of a botanic garden or arboretum in a much different light. Arboreta and botanical gardens, in summary, are contributing their share to human welfare:

1. They are the basic source of plants and information about plants for that vast army of Americans who have made home gardening their number one hobby.

2. They are the basic source of new information concerning plants which seeps into every level of education concerning the hundreds of thousands of plants known to science.

3. They serve as training grounds for our future plant scientists and gardeners.

4. More than a serene site of relaxation for "tired" businessmen, they can always add to the facilities available for passive, educational, cultural and meditative recreation.

5. It is to be observed that the trend of most of our park departments in this country is to make playgrounds out of more of our parks. The average person who formerly took a walk in a park because of the beautiful trees and other plants must now fear being hit by a baseball, run down by a charging herd of humanity, or finding some man-made structure where formerly stood a majestic tree. Our botanical gardens and arboreta must, in addition, serve a purpose for which much of the city park was originally designed.

The Art of Bonsai

(Continued from Page 58)

batable. Many advise repotting and root-pruning every two years, although not, of course, changing the size of the container. Others rarely repot and rarely root-prune. Two of the oldest and most lovely bonsai in Seattle have only been root-pruned once in thirty years and they are perfect examples of the art.

In regard to top pruning and shaping—it is this technique that makes good bonsai. One does not want a tree stunted and sickly. You want a tree healthy and small and in perfect proportion. It must be shapely. To produce a perfect miniature tree which will perhaps grow for hundreds of years without exceeding a foot or two in height, precisely proportioned in leaf, blossom, trunk and twig—that is the difficult and wonderful art.

The true style of shaping bonsai leaves the trunk and branches clearly outlined, every part in scale. Excess twigs are removed, revealing the main lines of the plant. One shapes and retards excess growth by pinching the tips of new growth in spring and fall, by tying one branch to another or by deftly bending with copper wire. Certain branches may be weighted down with heavy objects in order to obtain a line, and, of course, there should be thoughtful cutting of branches which destroy the line and effect you are trying to achieve. Wiring must be done while the tree is still pliable and the wire removed after a year or two when the branch or trunk is fixed in its new position. If the wire begins to cut into the bark, remove and rewire. Do not force the tree into a strange or unnatural shape but remember the effect, such as cascade or windswept, which you are trying to achieve.

Try for picturesque simplicity such as one encounters everywhere in nature. *The material defines the form.* However, one can help create the illusion of age such as by the exposure of a few heavy roots above the soil.

What about maintenance? How can you keep your bonsai alive and happy?

1. Keep out of doors as much as possible. Bonsai should never be inside (except in a greenhouse) for more than a few days at a time.

2. Water as needed—usually every day unless it rains. During the dry, hot days spray with water several times a day. In the Pacific Northwest where bonsai are generally kept outdoors except during freezing weather it is not necessary to water often.

3. If freezing weather comes, either pack with burlap or wrap in some material such as

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straw or, better still, bring your bonsai into a frostproof cool room or shed.

4. Fertilizer. A tablespoon to a quart of water is a mild but effective solution. This may be done three or four times a year from April to August.

5. Encourage the growth of a velvety moss on the soil surface and don't worry about the trunks and branches greening over. This will not damage the tree and many like the natural appearance.

6. Bonsai need light and air and only in the heat of summer would it be necessary to move the little trees to a more shady part of the garden. They are most effective on garden benches and on shelves. They are decorative just sitting on the patio or on a flat rock.

The title, The Art of Bonsai, was chosen with the full meaning implied. The growing and training of trees in containers so that they remain perfect small interpretations of their often giant-sized brothers in the forest *is an art*. It is not only an art such as fine flower arranging but an artistic work comparable to painting, music, dancing, sculpture or architecture. For the correct execution of every art demands dedication, patience, understanding, practice and, most of all, love for the art. Then, in addition to these qualities, the growing of bonsai requires infinite care.

However, the joy which comes with this art is great. Bonsai training, when pursued over a long period of years, seems also to train the grower in patience and aid in growth of artistic understanding. So, finally, perhaps bonsai should not only be classified as an art but as a philosophy and way of living.

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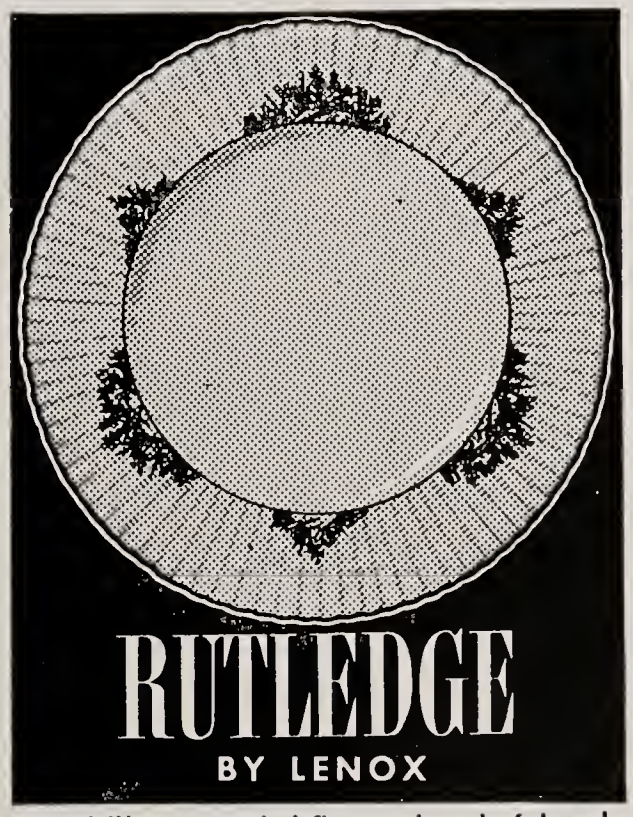

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Saving the Redwoods

(Continued from Page 69)

Humboldt and Del Norte counties has been achieved, it is continuing efforts to realize a comprehensive program which is by no means completed. Besides the Avenue of Giants, there remain in private ownership considerable areas of superb primeval redwoods in the Mill Creek-Smith River and the Prairie Creek regions. It is in the Prairie Creek wilderness that the only herd of native Roosevelt elk in California finds refuge. On upper Bull Creek there are still remarkable groves owned by lumber companies and private individuals, groves which should be in the State Park System. It is hoped these may ultimately be preserved before they are destroyed. In this cause of conservation much remains to be done.

Dr. John C. Merriam has characterized the primeval forest of Mill Creek as "an *Island in Time,*" adding that to this "island" we may go "to be thrilled, and to worship, in nature as it was and is—presented, perhaps, to show us in the living state some of the grandest works of creation accomplished within the span of time revealed to us by the records of the earth."

It will be seen that an orderly program is being carried forward for rounding out this northernmost State Redwood Park, which now embraces more than 9000 acres, some of them ranking with the most heavily timbered acres in the world.

To render timely aid in the move to acquire the parts of this great forest not yet protected within the State Park System, the League is making a nationwide appeal to raise the urgently needed funds from private sources.

It is recognized that acquisition is only the beginning of wise use and enjoyment, and that interpretation and the fullest understanding of the human values of the redwood forests will strengthen the cause of saving and safeguarding these wildernesses.

Through the years, the Save-the-Redwoods League has consistently aided in protecting the state parks, and particularly the primeval redwood reserves, against exploitation, against possible destructive highway and recreational development.

Not only the redwoods, but the ferns, oxalis, azaleas, rhododendrons and all the luxuriant native plants within the finest forests are being saved. They are a distinctive part of these "Giants' Gardens" and, unless protected, much of this woodland beauty soon would be gone.

Thickets of the Western Azalea *(Rhododendron occidentale)* are characteristic features of the redwood belt, and preservation of the finest areas of these flowering shrubs will be significant in the program for keeping the natural aspect of the region. As Dr. Willis L. Jepson has pointed out, "The delicacy of its large corollas, the floriferous character of the shrubs, the fragrance of the flowers, lend to our Western Azalea of the redwood belt, as it grows along streams, or in moist flats, an engaging charm. It is California's only species, and has a peculiar interest for us in geological history, in that it represents a life-link with the main group of azaleas—some 33 species in southeastern Asia and some 16 species in the southeastern United States."

An unique heritage for all the nation, the redwoods of California are being rescued with the aid of Americans everywhere. Cutting of the redwoods at a fast rate during the past year has emphasized the urgent necessity for preserving—before it is too late—the finest stands of these great trees not yet saved.

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